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Original Communications

LUNG COLLAPSE IN THE TREATMENT OF PULMONARY TUBERCULOSIS.*

By DEAN B. COLE, M. D.,
FRANK S. JOHNS, M. D.,
and
P. E. SCHOOLS, M. D.,
Richmond, Va.

Of the many specifics and other therapeutic cures that have been tried in the treatment of pulmonary tuberculosis, only one has stood the test of time, and that is rest. So well is this factor recognized that many mechanical devices and surgical procedures have been developed to aid in putting an afflicted lung at partial or complete rest and among these we have (1) Postural rest, advocated by Webb and Sewall; (2) Phrenic nerve section, causing hemi-paralysis of the diaphragm and partial lower lobe collapse; (3) Local replacement by some foreign body of the affected part, as paraffin, fat, etc., advocated by Tuffer; (4) Lung collapse by intra-pleural introduction of gas or air, first advocated by Forlanini in 1882 and later brought into more general use by Murphy in 1898; (5) Rib resection with narrowing of the chest, advocated by Friedrich, Wilms, Sauerbruch and others, but for this discovery credit should go to Brauer's combination of clinical insight and surgical imagination. In 1906 he suggested to his surgical colleague, Friedrich, the collapsing of the whole chest wall, and the operation was later carried out by resecting a long piece of all the ribs on one side.

These last two mentioned procedures, pneumothorax and thoracoplasty, underlie our present effort at a mechanical cure of pulmonary tuberculosis, and to a discussion of these will this paper be limited. As thoracoplasty is never done unless pneumothorax has failed, the indications and contra-indications for both procedures will be studied together.

The absolute indications for pneumothorax are: (1) moderately advanced or advanced disease with subacute course, with or without cavity, in which the process is strictly unilateral, or the tuberculosis of one side strictly latent; (2) severe uncontrollable pulmonary hemorrhage, in which the source of the bleeding is definitely known. The relative indications for pneumothorax are: (1) moderately advanced or advanced disease, with little tendency towards progression, with latent or inactive lesions on the other side; (2) incipient unilateral disease, progressive under other forms of treatment; (3) moderately advanced or far advanced patients with chronic type of lesion usually associated with cavity formation. Here treatment may be undertaken on the more active lung even with considerable trouble on the other side, in the hope of alleviating symptoms and getting the patient up and around; (4) very acute unilateral lesion of pneumonic type and if there is indication of beginning cavity formation, collapse should be induced immediately.

All patients receiving pneumothorax treatment should be thoroughly studied both before and during the period of treatment. Clinical findings, fluoroscopic observations and X-ray study should be correlated as to give an intimate understanding of the progress of the collapse and its effect on both patient and disease. Frequent fluoroscopic examinations are essential in determining the amount and uniformity of collapse, fluid formation, the presence or absence of adhesions, and whether or not there is mediastinal shifting. By a consideration of these factors, along with amount of air injected, frequency of air injections, and manometer readings, combined with physical examination, may be determined the condition of the collapsed lung. Rather frequent stereoscopic X-ray plates should be made to follow the progress of the contra-lateral lung, each new set of plates being compared with those made previously, as in this minute changes can be determined. The foregoing, along with a study of pulse, temperature variations, cough, amount and consistency of sputum, and general condition of patient, gives a

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very definite index as to the success or failure of the pneumothorax.

As to amount of air to be injected and frequency of injections, so many factors have to be considered individually, it is hard to lay down even general rules to follow. However, we believe from 300 to 500 c.c. of air to be the optimum and maximum quantities of air to be given at one time in cases without adhesions, never giving enough air to produce a positive intra-pleural pressure as determined by manometer readings. Cases having adhesions usually will require less air and greater pressure, but increase in pressure should be gradual, due to danger of rupture of adhesions. These can be stretched if this is done slowly. We believe better results with fewer complications are obtained by giving less air more frequently and keeping the lung as near optimum collapse as possible rather than giving large amounts of air at less frequent intervals with the accompanying wide fluctuations in intra-pleural pressures.

The most frequent complication is fluid formation, this occurring in about 50 per cent of all cases. Usually it is not necessary to withdraw this as it will soon absorb, but should the amount become excessive the fluid may be withdrawn and air substituted. Should the patient have a continued rise in temperature or fail to gain weight, an increase in disease of contra-lateral lung and intestinal tuberculosis, should both be looked for.

The operative treatment for advanced pulmonary tuberculosis is of interest to the medical man as well as to the surgeon. We may call it a surgical procedure of recent origin. It is an advancement upon a condition which the surgeon has long been reluctant to investigate. Already the operative results of thoracoplasty are sufficient to arouse the ultra-conservative. The principles involved in the operation are sound, its procedure logical, and its purpose so reasonable that even the skeptic is at a loss for complaint. Briefly, our plan is to produce physical and physiological rest by mechanical compression, so that the diseased areas of the lung will have a favorable chance for circumscribing and controlling the tuberculous lesion.

We note first the history and progress of thoracoplasty. Forty years ago, DeCerenville practiced some form of collapse of the chest-wall. His operation resulted in a high mortality and was soon discarded. A few years later an operation on the apex of the lung was advocated; it has been modified and improved until today we use it under the term apicolysis. In 1908 Friedrich and Brauer advanced a type of thoracoplasty which has stood the test of time. Like every surgical procedure, this operation has had many modifications and improvements, but the fundamental principles have remained the same. Sauerbruch realized that Friedrich's operation was too radical for tuberculous cases and introduced a more conservative type of operation which has been, generally speaking, universally adopted.

The selection of cases as to indication and contra-indication is by far the most important point in this whole subject. At the outset it should be emphasized that if pneumothorax has a possible chance to bring about the desired results, it should have continued preference over thoracoplasty. The indications for thoracoplasty and pneumothorax have many points in common, therefore, the closest co-operation between an expert in tuberculosis and the surgeon is absolutely essential.

The indications for thoracoplasty are as follows:

1. Cases ideal for pneumothorax but for the fact that dense adhesions exist. It is understood that pneumotharax has always been attempted by one skilled in its use.

2. Cases of pulmonary tuberculosis following trauma to the lung and pleura. Such cases are unsuited for pneumothorax because a satisfactory collapse is impossible from the beginning.

3. Thoracoplasty has been suggested in cases of severe hemorrhage.

4. In cavity formation, more especially those of the base. (The combined adhesions to the diaphragm and parietal pleura prevent a working collapse by pneumothorax.)

5. Thoracoplasty should always be used in tuberculous cases with fistulous tracts.

6. Cases in which only partial pneumothorax can be produced (a partial thoracoplasty has proven beneficial).

7. Finally, thoracoplasty has proven most suitable in certain fibrous forms of pulmonary tuberculosis.

Contra-indications for the operation:

1. Tuberculous disease elsewhere in the body, intestines, kidney, bone, etc.

2. Disease of myocardium, valvular disease, nephritis.

3. The condition of the good lung. This is of vital importance. The literature is full of such statements as "unilateral involvement." Theoretically, this may be possible. Clinically, we have never had the good fortune to draw such a case. It seems to us the term inactive or arrested involvement of the "good lung" would be more accurate and just as impressive.

4. Age of patient.—It is impossible to fix the age limit for thoracoplasty, but certainly the young and advanced in years are not, generally speaking, suitable cases.

The operation of choice consists of collapsing the chest by resecting proportionate lengths of the ribs from the tenth through the first. Occasionally it may be necessary to resect the eleventh rib. The operation is carried out posteriorly, always including the angles of the ribs. The advantage of the posterior operation is that a greater collapse is produced. The amount of ribs removed is determined by the extent of collapse necessary and the condition of the patient. The operation should be done in one or more stages. Personally, we have done all of our cases in two or more stages. It is important not to shock your patient. If the question arises whether or not the patient will stand the removal of another rib leave that rib for the next stage of the operation. Trying to do just a little more furnishes the operative mortality. Tuberculous patients do not stand general anesthesia well. We prefer novocaine alone or combined with ethylene.

Post-operative treatment must be carried out in careful detail. Strapping the chest snugly will increase the amount of compression and also decrease the amount of pain. Morphine should be given freely for the first twenty-four hours. The patient should be encouraged to cough at intervals, and turned in bed several times during the first post-operative night and day. The purpose of this is to prevent an accumulation of secretion.

Certain adjuncts to the operation should be mentioned. Phrenicotomy is probably the most important adjunct to thoracoplasty. It has been used as an index to the patient's condition. If this minor operation was borne badly the major operation was not done. The usefulness of nerve clipping operations is on the increase. Alexander is advocating it as a routine procedure to replace the first stages of a thoracoplasty, namely, resection of the tenth to the sixth ribs inclusive. He argues that the same amount of compression is induced, that the chances for post-operative pneumonia are practically eliminated, and the operation itself causes no shock.

Apicolysis should be used in cases with stubborn cavities in the apex which are not collapsed sufficiently by thoracoplasty. Transplants of fat or muscles may be used as fills. One should be cautious not to injure the pleura during this operation.

We have done thoracoplasties on thirteen cases of pulmonary tuberculosis. It is an inspiring fact that no case has been made worse by the operation. Thirty-three per cent of our cases seem to be well. The remaining cases are improved with the exception of one death thirteen days after operation from pneumonia in the good lung.

We are convinced that as soon as this surgical procedure is thoroughly understood, so that such cases can be referred more promptly for surgical treatment, an increasing number will be cured and improved. Thus, a large majority of these heretofore hopeless victims of tuberculosis will be restored to their homes and even enabled to earn a living for themselves and their families.

DISCUSSION.

DR. GERALD A. EZEKIEL, *Richmond*: The question of collapse of the lung comes back, really, to the application of one of the fundamental principles in the treatment of tuberculosis, and that is rest, carried out over a sufficiently long time. If a patient has a sore eye, we can place a little patch over it and he can use the other eye. If a patient has a bad lung, it can be collapsed and he can go on leading his usual life. Of course, the first portion of the period of collapse should be spent as a bed case.

There is some prejudice on the part of patients to this treatment. In dealing with this work we have to be very conservative in the selection of cases, because, if we were to have a high mortality, it would soon go into disrepute. We have a disadvantage here that the surgeon does not have in other fields. They can experiment on animals, but here we can not do that. A good many of these cases are desperate, and are willing to undertake anything. They know what is staring them in the face, so we are justified in being a little radical at times, I think. One patient has had only the first stage of the radical operation, and his life has certainly been prolonged. Whether this is advisable or not we do not know. Certainly it has been worth while to his family. It may be that after a while he will be in better condition and can have the operation completed.

There is one point in the paper with which I should like to differ. That is, I do not believe a

thoracoplasty is advisable in a case of hemorrhage. This operation should not be done while shock is present, and the patient is certainly shocked after hemorrhage. Pneumothorax should be attempted. It used to be feared, at times, that putting a needle into the thoracic cavity would collapse the lung, but today we have no fear of such a collapse, and under novocain it can be easily accomplished.

DR. FRANK B. STAFFORD, *Charlottesville*: This subject of artificial pneumothorax and thoracoplasty is very interesting to me.

At Blue Ridge Sanatorium we have had for the last three or four years an average of about twenty cases of pneumothorax. This treatment is something that will benefit a patient more than would ever be thought until you have had some experience with it. We used to approach the subject with much fear and hesitation, lest we should not get the results hoped for. Naturally, the results to be obtained will, to a certain extent, depend upon the number of adhesions which exist between the visceral and the parietal layers of the pleura, which usually govern the degree of collapse. Often it will be found that, even though these adhesions are numerous, a small part of the diseased portion of the lung can be collapsed, and much benefit derived from it. It is surprising how many of these adhesions can be dissected loose by close observation of the patient and gradual increase of the air in the pleural sac.

As to the selection of a case suitable for pneumothorax, many points must be considered. If we wait for a strictly unilateral lesion (something that is seldom seen), very few cases will be selected. The stethoscope may not reveal involvement in the opposite lung, but the stereoscopic X-ray films usually clear up the situation and enable us to determine the character and extent of the trouble there.

In a large percentage of these bilateral cases, by a partial collapse of the lung containing the greater degree of involvement, and by putting the patient strictly to bed, the temperature will usually come down, acute symptoms will subside, and the tissues will have a chance to react from the absorption of tuberculous toxins; and the life of the patient may be greatly prolonged.

It used to be that after the treatment was well under way, and after the temperature had gone down for two or three weeks, we would allow the patient to be up and around on the pavilion and to go to the dining-room for meals. Recently we have found that, if the best results are to be accomplished, the patient should be kept in bed for two or three months. This procedure, I think, should be adhered to regardless of whether or not the patient has much disease in the opposite lung.

It is not always advisable to wait on the patient before considering collapse. Usually, if the symptoms, corroborated by the X-ray findings, indicate an acute type of the disease, then this form of treatment should be considered at once.

Dr. David Lyman, of Gaylord Farm, Wallingford, Conn., states that he has about ten per cent of his patients taking the pneumothorax treatment; also, that he often collapses a lung that has only a small amount of involvement, or in early cases; and that he gets much better results than to allow the patients to go on with the regular hygienic treatment as prescribed in the sanatorium. This has also been our experience at Blue Ridge Sanatorium.

Those cases where the adhesions are so numerous and extensive that pneumothorax can not be given, should, I feel, be considered for thoracoplasty. This form of treatment, generally speaking, is harmless, and it certainly offers an opportunity for a number of cases, suffering from this disease, to be restored to a life of usefulness.

DR. F. S. JOHNS, *Richmond*, closing the discussion: I think Dr. Ezekiel misinterpreted my remarks about hemorrhage. In the first paragraph I said if there is a possibility of artificial pneumothorax bringing about the desired results, we do not do thoracoplasty. So, of course, in hemorrhage, if there is a possibility of artificial pneumothorax collapsing the lung, thoracoplasty is not done. However, in the stage between hemorrhages, if it seems that pneumothorax will not give further benefit, we can do the thoracoplasty.

PUERPERAL SEPSIS—REPORT OF CASES OF INTRAPARTUM INFECTIONS.*

By MILLARD B. SAVAGE, M. D., Norfolk, Va.

In this paper I wish to cover briefly a few points upon puerperal sepsis in general, and then, in conclusion, I have a few cases of puerperal infection intrapartum to report. These cases differ somewhat from the usual type of sepsis, and for that reason are interesting.

Puerperal sepsis, puerperal infection, puerperal or "child-bed" fever, in all probability date back as far as the history of human life and its procreation, and without doubt clinical types of it will exist as long as the race of man. With the dawn of the modern day, such men as Charles White, Semmelweis, Oliver Wendell Holmes and others have taught us the etiological factors in this long existing and dreaded disease. Equally important, the bacteriologists have demonstrated the very bacterial organisms which are the causative agents in this condition. Surely, from the teachings of these men which have shown us the how and why of puerperal sepsis, we have gathered some foundation for a prophylactic treatment against it. Yet, when one peruses the present day statistics upon the mortality rate from puerperal infection, one wonders if full advantage is being taken of our knowledge of prophylactic treatment for this condition.

Eichel,[1] in a statistical study of cases of puerperal infection in New York State, reports on 205 deaths which occurred during 1922 and 1923. In this study he obtained satisfactory explanation as to the cause of death in 72 per cent of the cases. About 34 per cent of the deaths followed abortions and miscarriages. Twenty-six per cent of deaths followed ob-

*Read before the Norfolk County Medical Society, February 22, 1926.

1. Otto Eichel. **Amer. Jour. Obs. & Gyn.** 1924. Vol. 7, p. 667.

stetrical operations, such as Cesarean section, version, and forceps delivery. Thirty per cent of the cases were classed as neglected cases, which included those cases where there was late interference and delay in the treatment. In commenting upon the statistics, a few of the recommendations to help remedy the present existing state were as follows: First, to educate the public as to dangers of abortion and the necessity for prompt care of these cases. Second, to educate the public as to the hazards of abnormal conditions connected with pregnancy. Third, to attempt to secure adequate clinical facilities for the poor. Fourth, to elevate the present standard of obstetrical training, and, lastly, for physicians to employ strict asepsis in all cases and to take particular care in those cases requiring interference.

Ronsheim,[2] in reporting six cases of puerperal infection, each of a different clinical type, gives an interesting classification of the various manifestations of the condition.

Septic endometritis begins with a chill and is followed by a moderate elevation of temperature. There is some pain in the region of the fundus. The uterus is large, tender and somewhat soft. Lochia is profuse, bloody and foul in odor. Improvement is rapid under appropriate treatment.

The bacteriemias have their onset with a severe chill and rapid elevation of temperature. As a rule, other chills do not follow. The pulse becomes rapid and thready. Headache, extreme weakness, insomnia, euphoria and mental confusion are usually constant. Positive blood culture completes the diagnosis.

Parametritis has a late onset, and the chill is not always distinct. The temperature is moderately elevated and there is pain and tenderness to one side of the pelvis. Bimanual examination reveals a mass of varying size in the adjacent tissue and to one side of the uterus, cervix or vagina. The region of the bladder and cul-de-sac are free. The mass is hard, immobile, tender and continuous with the uterus. Blood culture is negative.

Thrombo-phlebitis is characterized by its violent onset with a severe chill which lasts thirty minutes or more. The chills are repeated, the temperature shows extreme variations, and sweating is profuse and exhausting. The pain is low in the pelvis. Bimanual examination is usually negative beecause the process most often confines itself to the veins alone. Later, embolic processes appear. Positive blood culture may be obtained if taken during a chill.

Phlegmasia alba dolens is characterized by a pain beginning in labium and spreading to the thigh. The edema of the thigh is marked while the edema of the leg may be slight and late in appearing.

The clinical types just described may be grouped together because of their pelvic origin. Puerperal infection in a general way may also include intercurrent disease, breast abscess or other inflammatory process at the time of or following labor. The danger of intercurrent disease, particularly pneumonia, influenza, septic sore throat, or even "colds," during labor is well known and very much feared as a complication of labor. The cases of so-called autoinfection are rare but do occur. The prevention of this type of infection is a problem, and for just reason any ailment, trivial or other, occurring during late pregnancy should be regarded with suspicion and treated accordingly.

Puerperal infection may be classified as to the mode of infection. The infection may ascend through natural channels, the vagina and uterus, or it may descend through the blood stream or by contiguity. The ascending type is the more common, and the offending organisms, in the order of their frequency, are the streptococci, staphylococci, gonococci, colon bacilli, gas bacilli and pneumococci. A high standard in the practice of obstetrics can help reduce the ascending type of infection to a minimum. Rectal examination is preferable. Vaginal examination should not be frequent and should be employed under strict asepsis when necessary. The observance of some few precautions both prenatal and during labor should result in a marked decrease in our death rate during each year from sepsis.

The curative treatment of puerperal infection depends upon the clinical manifestation of the disease, the organisms which cause it, and the pathology which is present. In general, the conservative treatment is better. The antiseptic douche has been used without results. The curette has been used with dangerous results. General surgical principles apply to obstetrics as to any other pathological condition with localized pus. It should be evacuated. Vaccines, serums and intravenous

2. Joshua Ronsheim. Amer. Jour. Obs. & Gyn. Vol. 8, p. 363.

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medications have been used frequently and results both good and bad have been reported.

Costain[3] and Edwards[4] have reported treatment of puerperal sepsis by means of draining the thoracic duct. By this means the toxemia from lymphatic absorption is relieved. In their cases they have recovered the same organisms in the fluid draining from the thoracic duct as were obtained from smears taken from the uterine cavity.

Both transfusions and dyes by intravenous route have been used very much in the treatment of infections.

Mendenhall, of Indianapolis, in a personal communication of recent date, comments upon the use of mercurochrome in obstetrics as follows:

"Mercurochrome is not going to solve all our problems and as yet I am not satisfied to use it in preparing a field for delivery. I had apparent success with the use of mercurochrome intravenously and at first was enthusiastic, but now I greatly doubt its value."

He believes that the most recent progress in the treatment of puerperal infection has been made by giving blood transfusions. Multiple small transfusions from 200 to 400 c.c. are more effective than one massive transfusion. The prophylactic treatment of puerperal sepsis is the most satisfactory treatment. Prevention should be the ideal of each one doing obstetrics, for the life of someone's loved one is at stake in every case of infection.

I have a few remarks to make upon infection intrapartum before making the case reports. Very little reference to it is made in the text-books, and only isolated cases may be found in the current literature. Its frequency may be much greater than would be expected, and diagnosis may not be made where temperature and pulse readings are not taken routinely before and after delivery. Williams[5] states that intrapartum infection may occur with slow labors and with premature rupture of the membranes. A temperature of 100.5 degrees F. and septic appearance should be an indication to hasten the evacuation of the uterus during labor.

Jewett[6] states that in a certain number of cases infection may occur before the birth of the child. These cases are designated as infection intrapartum. It usually occurs in slow labor where the membranes had ruptured at an early period. The temperature of 100.5 degrees F. should suggest the possibility of this complication and indicate necessity for the speedy termination of labor. Edgar[7] states that when symptoms of fever, increased pulse rate out of proportion to the fever, sensitiveness of the pelvic organs to pressure, disturbed involution, and diminution in amount of lochia occurred a few hours after labor, they are probably due to infection during or before labor.

Case 1. Para 6. Reported by Wolfe[8] as case of intrapartum and postpartum streptococcic septicemia of extrapelvic origin. Admitted to Dr. Polak's Clinic in Brooklyn, N. Y., on January 26, 1921. Had been under prenatal care for three months previously. Other pregnancies and labors had been normal. Three days previous to admission, patient developed a cough and sore throat. Labor began at noon January 26th. Was admitted to the hospital at 9 P. M. the same day. Temperature upon admission was 102 degrees F., and pulse rate was 116. Respiration was 24. Face was flushed and pharynx was injected. A few subcrepitant rales could be made out at both bases. Presentation was R. Sc. A. Cervix dilated to 3 c.m., and pains occurred every four minutes. Leucocyte count was 9,000 cells. P. M. N.s were 83 per cent. Labor proceeded satisfactorily during the night. At 8:30 A. M. on the following morning the membranes ruptured spontaneously and a living female child was delivered shortly afterwards. The child cried weakly but remained cyanotic. The third stage was uneventful. The progress of labor was followed throughout by means of rectal examination.

One hour after labor: The temperature was 104 degrees F, pulse rate was 130, and the respiration was 38. Examination of the throat revealed a white patch upon the left tonsil. The leucocyte count twelve hours after labor was 24,000 cells and 85 per cent P. M. N.s.

The child remained dyspneic from birth and died in fourteen hours. Autopsy diagnosis: Septicemia and broncho-pneumonia of more than fourteen hours' duration. Organism present was hemolytic streptococcus.

The puerperium was long and stormy. The temperature during the first three days varied from 100.8 to 104.2 degrees F. Pulse varied

3. Costain. **Surg. Gyn. & Obs.** 1923. March.
4. A. C. Edwards. **Surg. Gyn. & Obs.** 1924. Vol. 38, p. 257.
5. Williams. Text-Book on Obs., p. 956.
6. Jewett. Text-Book, p. 590.
7. Edgar. Text-Book. p. 723.
8. Samuel Wolfe. **Amer. Jour. Obs. & Gyn.** 1924. Vol. 7, p. 97.

from 120 to 140. Respiration varied from 30 to 40. During the fourth to the tenth days severe septic intoxication was present with occasional attacks of mania. The throat remained infected and culture from patch on tonsil was positive for staphylococcus and hemolytic streptococcus. Smear taken from the cervical canal was positive for hemolytic streptococcus. A blood transfusion of 300 c.c. of blood was given on the fifth day and a second transfusion of 275 c.c. was given on the ninth day. From the tenth day the throat and lung symptoms began gradually to disappear. Good involution of the uterus occurred and the lochia was scant by the tenth day. Later numerous metastatic abscesses of the buttocks, thighs, legs and arms developed and were drained by multiple incisions. Cultures from the pus were positive for hemolytic streptococcus. The patient was discharged on the seventy-seventh day after labor.

In this case a streptococcic sore throat and tonsillitis produced an antepartum bacteriemia and fetal infection before birth. The pneumonic process in the lungs of the child was demonstrated as interstitial in character and differed from the aspiratory pneumonias. The maternal bacteriemia persisted after labor, and the streptococcus hemolyticus was found present in the uterine cavity by the fourth day of the postpartum. A similar organism was obtained by blood culture on the seventh day, and a clinical course of septic pyemia followed. Similarity in morphology and sugar fermentation of the bacteria which were recovered from the mother's throat, the blood stream, the uterus, and the fetus, suggested auto-infection from a common source, the throat and tonsil.

Case 2. Para 2. White. Admitted to clinic of Protestant Hospital at 3 P. M. on August 15, 1924. Previous pregnancies were normal other than history of two still-births. Patient gave a history of onset of labor seven days previous to admission to the hospital. Membranes had ruptured five days previously. Several vaginal examinations had been made daily by family physician. Labor had not progressed. Patient had not felt any fetal movement for three days before coming to the hospital. When first seen, the temperature was 101.4 degrees F., and pulse rate was 120. There was a dark bloody fluid discharge at intervals from the vagina. The odor of the discharge was offensive in character. The labor pains were intermittent but uterus was in a tonic contraction. Cervix was dilated from two to three fingers. A No. 5 Voorhees' hydrostatic bag was inserted through the cervix and five hours later the bag and a macerated fetus were expelled. The placenta was delivered by manual extraction one and one-half hours later. A Bandl's contraction ring was present and deep ether anaesthesia was necessary in order to extract the placenta.

When the labor was terminated, the temperature of the patient was 105.4 degrees F., and the pulse rate was 140. One hour after labor the temperature was 103.4 degrees and the pulse rate 160.

During the first day after labor the patient became very toxic and delirious. Thirty c.c. of 1 per cent mercurochrome solution was given intravenously and 1,500 c.c. of normal saline was given subcutaneously. The temperature was subnormal and the pulse rate varied from 120 to 150.

During the morning of the second day of postpartum, a uterine hemorrhage of moderate severity occurred. Uterus was packed to control the hemorrhage. Blood transfusion of 500 c.c. was given in the afternoon. Patient died during the night. Laboratory reported negative blood culture, negative Wassermann, and 6,000 leucocytes. Autopsy diagnosis: Acute pelvic peritonitis and extensive infiltration and necrosis of the uterine wall.

This case is somewhat illustrative of the text-book description of infection intrapartum. There was a prolonged complicated labor, an early rupture of the membranes, potential infection by early and frequent vaginal examinations, and lastly interference was late and complications neecessitated repeated invasion of the uterine cavity where infection lurked.

Case 3. Colored. Age thirty-eight. Para 2. Previous normal pregnancy had occurred seventeen years before. History of onset of labor pains on June 29, 1925. Patient was attended by a midwife. Physican was called in on fourth day of labor. Patient seen at noon July 3rd. Was having pains every five minutes. Contractions were strong. Temperature at that time was 102 degrees F. Pulse rate was 120. Patient was an extremely fat person and abdomen was very prominent. Height of fundus measured 45 cm. History of mem-

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branes rupturing two days previously was given. No fetal heart could be heard and fetal movements had been felt somewhat feeble for twelve hours. Rectal examination revealed a large caput and the fetal head about mid-pelvis. Cervix was three or four fingers dilated and very much thinned. Patient was given one-quarter grain of morphine sulphate and left with the expectation of delivery to occur spontaneously in five or six hours time. Patient was seen again at 9 P. M. that night. Progress had been slight. Temperature was 103 degrees F. Pulse rate was 140. Cervix was completely dilated. A hard mid-forceps delivery was done with the Scanzoni method of rotating the occiput posteriorly. Delivery required forty-five minutes under chloroform and ether anesthesia. A still-born male child, which weighed fourteen pounds was delivered. Episiotomy was done to facilitate birth of the head, and the incision was enlarged to facilitate the birth of the shoulders. Shoulders were also delivered by application of the forceps. Third stage was uneventful.

One hour after labor temperature was 99.2 degrees and pulse was 100. Patient rational and comfortable.

During the first day after labor, temperature dropped to 98 degrees F., and pulse gradually increased to 120 and 140. Pulse became irregular. No odor to the lochia, which was slight. Patient complained of severe pain through the abdomen and down the left leg. Patient died rather suddenly in the afternoon before a physician could be called. No autopsy was obtained.

In this case there was a prolonged labor due to an excessively large baby, the membranes ruptured early, infection was potential from examinations of the midwife, and late interference, together with a difficult forceps, added the necessary factors to add this one more case to our high mortality rate from puerperal sepsis.

400 *Fairfax Avenue.*

SIMPLE EXPLANATION

A colleague of Dr. Crun Brown, the famous Edinburg professor of chemistry, once came to him concerning an Indian medical student whose English was defective.

"We cannot pass this man," he said. "He is quite illiterate; he simply cannot spell. Why, he has spelt proceed with one 'e'."

"From what place does he come?" asked Doctor Brown.

"From Ceylon."

At once Doctor Brown flashed back: "That explains it. That's the land of the Cingalese."

EXCESSIVE VOMITING OF PREGNANCY.*

By L. A. CALKINS, M. D., Ph. D., University, Va.

This discussion is given under the caption "Excessive Vomiting of Pregnancy" because that would seem to be a better term than Hyperemesis Gravidarum, or even Pernicious Vomiting of Pregnancy. Approximately 50 per cent of women will have a greater or less degree of nausea and vomiting at some stage of their pregnancy. On the other hand, it is not an every-day occurrence for us to see a really pernicious case. In between the mildest disturbance and the most severe one are all possible gradations of involvement. It would seem, therefore, that the differentiation of ordinary vomiting of pregnancy and pernicious vomiting of pregnancy were only a matter of degree. Hence, the term "Excessive Vomiting of Pregnancy" would, theoretically at least, seem preferable to the other terms more frequently used.

I shall attempt to include in this discussion all cases of vomiting and not limit it to the excessive vomiting type except insofar as the more severe cases require a more elaborate treatment than the milder ones.

The etiology of this condition is as yet poorly understood. It has long been classed with the toxemias because it seem to be brought about by some toxin, and also because this is a convenient sort of description for almost any condition that we cannot otherwise explain. In recent years the suggestion has been made by Dr. D. J. Harding, and his co-workers of Toronto, Canada, that there is a depletion of glycogen in the liver. This hypothesis, although not definitely proven, has met with quite ready acceptance, and, on the basis of this theory, the treatment has come to involve the use of both glucose and insulin by many workers. More recently dehydration has been thought to be a factor, and the treatment has been made to include the giving of large amounts of fluid. Previous to these two ideas we attempted to class these cases as toxemic, reflex, or neurotic in type, and there are still many who believe that the neurotic element is the most prominent predisposing cause for this condition. There is one other possibility in etiology that has not received very serious consideration, namely, protein intoxication

*Read before the Norfolk County Medical Society, February 22, 1926.

through the intestinal tract, such as we get in many other conditions of intestinal stasis or partial intestinal obstruction. That toxemia from such a cause can occur, is beyond question. Just why such an intoxication should occur during early pregnancy without a previous intestinal disturbance is not at once apparent, but the symptoms and course of these vomiting cases strongly suggest such a possibility.

The course of vomiting of pregnancy is so well known to all of you that it is not necessary to restate it in detail. It might be well to outline certain characteristics. The first, or mild stage of the condition, is very amenable to mild measures in the way of treatment and does not possess any serious aspects as far as the patient is concerned. The great difficulty is that women have been gradually trained over a period of centuries to the idea that vomiting is a necessary part and parcel of pregnancy, and that there is nothing to do but grin and bear it until they get far enough along that it will automatically disappear. As the result of this training and belief, they very frequently do not report their condition to their physician until they have become considerably worse, when they might be said to be in the second or moderate stage of the disease. During this stage they vomit from one to several times a day, and become gradually, but nevertheless certainly, worse. Fortunately, many of them improve. This second stage of the disease is comparatively long, and, with proper treatment, can be quite readily managed. Much more rarely we see people in the so-called third stage, which can be determined as being present only by elaborate chemical tests. This stage is almost uniformly fatal. If the patient has progressed to this third stage, therapeutic abortion, or any other measure, cannot save her. Previous to going into this final or third stage, therapeutic abortion gives good results in the way of recovery, which is definite and prompt. We have, therefore, for a hundred years been performing therapeutic abortions for this condition, and, I am sorry to say, are still performing them because of the lack of knowledge of any other satisfactory treatment that is uniformly successful.

My only excuse for appearing before you and giving this paper is to offer another treatment which, in the hands of many men, has proven eminently successful, and which, in their hands, has obviated the necessity of performing a therapeutic abortion on these women. This treatment is not new, nor have I had any part in developing it. It was taught to me as a medical student by Dr. J. C. Litzenberg, of Minneapolis, who has used it routinely and successfully for about twenty years. During those twenty years he has had one failure, where a therapeutic abortion become necessary. I have had the opportunity of using this treatment on approximately two hundred cases, and, so far, have not had a single failure. There were a few cases in the group which were improved only. The great majority should be called cured. I shall first give you the routine employed in the severe cases:

They are put to bed, either in the hospital or in the home, and the lower bowel thoroughly cleaned out by repeated enemata. Then, after a period of a couple of hours, the definitive treatment is begun. They are given by rectum 60 grains of sodium bromide in two or three ounces of water. This medication is repeated every six hours so that the patient receives four doses of 60 grains, a total of 240 grains, in each twenty-four hours. It is usually necessary to place the patient on complete starvation for the first twenty-four hours, neither solids nor liquids being allowed. This will serve to stop the retching which may otherwise continue. At the end of the twenty-four hour period feeding is begun. At first small amounts of either liquids or solids are allowed, as desired by the patient. The heavy doses of the bromide are continued for a varying period of time, according to the severity of the vomiting and the response of the patient. It is very important that the patient receive the full 60 grains at each dose and that the doses be repeated at each six hour interval in the beginning. A dose of 50 grains does not seem to suffice, nor is it satisfactory to give four doses during the waking hours and allow a longer period or interval to elapse during the night. Usually the patient will be so well under the effects of bromides after two or three days that the dose can then be gradually diminished. We usually drop down to a 50 grain dose; then, after a period of another two or three days, to a 40 grain dose; and then, at the next step, begin giving 20 grains by mouth, preserving the six hour interval as nearly as possible. During this time the feed-

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ing is increased and the patient rather rapidly gotten up to a truly high carbohydrate diet. Co-incidentally with this increase in diet, we attempt to increase the fluid intake as well, in order to combat the dehydration which is theoretically present.

Most of these patients, before treatment has been started, have lost a considerable amount of weight. This weight loss is best restored by a high intake of fluids and carbohydrates. I usually tell these people, much to their surprise, that their husbands may bring them a box of candy. The period of rest in bed is well advised because in that way the full effect of the increased diet can best be obtained. A week or ten days is the usual rest period necessary.

Most of these people cease vomiting before the third dose of bromide has been given and do not vomit thereafter. It is not at all uncommon that no further vomiting occurs after the first dose of bromide is given. It is necessary at this point to sound two warnings: First, that the dosage must not be decreased too rapidly, and, second, that it should not be stopped too soon. I have given above the usual method and way of decreasing the dose. It remains to say that the medication should be continued in small doses, 10, 15 or 20 grains three times daily, over a period of two to six weeks after the heavy medication has been stopped.

The milder cases can be quite satisfactorily treated, although with not as brilliant results, by a less vigorous regime. Where the vomiting occurs only once a day or the patient is suffering from a nausea only, we usually do not feel like insisting upon the full treatment outlined above, and attempt to go part way by merely prescribing a high carbohydrate diet and bromides in 15 or 20 grain doses by mouth. These people are nearly always improved, but are not as quickly nor as thoroughly cured by these measures as are the severe cases.

I feel that this bromide treatment is an empiric form of treatment and that we have no sound scientific basis for it. My only answer for being unscientific in this matter is that the results speak for themselves, and, until something more scientific can be developed, I cannot help but feel that, if therapeutic abortions can be prevented by using this treatment, we are thoroughly justified in employing it. I have no hesitancy in stating that therapeutic abortions will be rarely, if ever, neccessary, if this treatment is carefully followed. Moreover, it would seem to be unnecessary for patients to be told that there was nothing to be done for them when they are suffering from so-called "morning sickness." Finally, in this, as in many other medical conditions, the earlier treatment is begun, the more ready and more certain is the relief obtained.

PARTIAL GASTRECTOMY UNDER LOCAL ANESTHESIA FOR CANCER OF THE STOMACH IN A MAN 71 YEARS OF AGE.*

By J. SHELTON HORSLEY, M. D., Richmond, Va.
(From the Surgical Department of St. Elizabeth's Hospital).

In cancer of the stomach only one therapy is known to have cured, and that is surgical excision of the cancer. Whatever may be the different views about the treatment of peptic ulcer, the opinion is unanimous that cancer of the stomach if not too advanced calls for gastrectomy. Gastric peptic ulcer is undoubtedly an etiologic factor in cancer of the stomach. This is universally acknowledged, but the proportion of cases of gastric cancer that have their origin in peptic ulcer is disputed. Some say it is not more than 10 per cent. At the Mayo Clinic the ratio at one time was given as high as 70 per cent. Cancers elsewhere in the body often arise from points of irritation; a cracked lip or tongue, an old scar, a wart or mole that is frequently irritated, are all well-known starting points of malignancy. It seems entirely logical, then, that we should expect gastric peptic ulcer at least occasionally to give rise to cancer of the stomach.

Any gastric ulcer that attains the size of an inch in diameter is always suspicious of cancer. The advisability of excising a gastric ulcer as a prophlaxis for cancer must be borne in mind. Unless the ulcer is followed very carefully from its inception, it is impossible to say what changes may take place. I have had in my own experience a patient who developed cancer of the stomach after having a history of recurrent stomach pains relieved by food and alkali off and on for thirty years. Though duodenal cancer occurs, it is very rare, so extirpation of a duodenal ulcer is hardly an indication as a prophylaxis for cancer.

Patients with cancer of the stomach are

*Read before the Richmond Academy of Medicine, Richmond, Va., April 13, 1926.

usually bad risks. They bear a general anesthetic poorly. No matter how safe the general anesthetic may be under ordinary conditions, any therapeutic agent that is sufficiently powerful to produce and maintain general analgesia and unconsciousness must have some reaction. So it is particularly in these patients that a local anesthetic finds an appropriate field.

The type of operation to be done is, of course, an important factor. Formerly, following the general trend, I did the anterior Polya or the Polya-Balfour operation, in which, after removing the pyloric portion of the stomach, the jejunum is brought over the transverse colon and sutured to the cardiac stump of the stomach. While it has some apparent advantages in permitting more of the stomach to be resected and in shortening the time of operation, the principles on which it is founded are not, on the whole, so satisfactory as those of the original Billroth I and the Billroth II operations. A loop of jejunum that goes over the transverse colon has potentialities for trouble. There may be a kink or obstruction, and if an entero-anastomosis is made between the limbs of the loop much of the duodenal contents is diverted from the stump of the stomact. This predisposes to jejunal ulcer. The natural mixing chamber for the gastric contents and the duodenal contents is in the duodenum, and the general principles of the Billroth I operation, in which the stump of the stomach is anastomosed to the stump of duodenum, are founded on this good physiologic principle. The space beneath the limbs of jejunum that go over the transverse colon offers decided opportunities for loops of bowel to insinuate themselves in it and cause obstruction.

One of the two chief objections to the Billroth I is that the anastomosis in the orginal Billroth I was along the greater curvature of the stomach. This made closure at the upper portion of the duodenal stump difficult, and frequently there was leakage in this area. It was called the deadly triangle. The general axis of peristalsis is along the lesser curvature of the stomach, and the researches of Alvarez, and recently of Eugene Klein, of New York, have shown that the lesser curvature appears to contain a type of neuromuscular tissue in which gastric peristalsis seems to originate. An ulcer along the lesser curvature will produce contraction of a segment of the stomach corresponding to the ulcer, and frequently will form an hour-glass stomach, when a similar lesion along the greater curvature may have but little effect and often gives no symptoms. Consequently, I have modified the Billroth I operation by making the anastomosis along the lesser curvature of the stomach instead of along the greater, and have added another modification in incising the anterior wall of the duodenum for an inch or an inch and a half, and flaring it open, so avoiding the second chief objection of a possible constriction at the point of anastomosis which ordinarily might occur when the thick wall of the stomach is sutured to the thin duodenal wall. Then, too, it is easier and safer to fold in the lower teat of the stomach and to bring peritoneal covered fat over this region along the lower border of the duodenum, as is done in this modification, than it is to suture the upper end of the duodenal stump to the redundant upper portion of the gastric stump as must be done when the anastomosis is made at the greater curvature.

In most cases of partial gastrectomy the stump of the stomach can be united to the duodenum. Finney has done a total gastrectomy, uniting the esophagus to the duodenum end-to-side. In such a case, to be sure, there is great contraction of the stomach and the esophagus has been elongated, but it shows the possibility of this principle. It seems best, however, to disturb the duodenum as little as possible, though by mobilizing the end of its stump some increased length can be obtained. The main dependence, for approximation without tension is placed on mobilizing the gastric stump, which is more easily done and with less disturbance to the tissues. After dividing adherent bands the gastric stump is brought over, still clamped with the Payr clamp, and the posterior wall of the stump of the stomach is sutured to the posterior wall of the stump of the duodenum in such a manner that the lesser curvature of the stump of the stomach will be in line with the upper border of the duodenum. The clamps on the stomach and on the duodenum are then removed and the posterior margin of the stump of the stomach is united to the posterior margin of the stump of the duodenum with a continuous lock-stitch of No. 1 tanned catgut—beginning at the lesser curvature. When the lower border of the duodenum is reached, an incision about an

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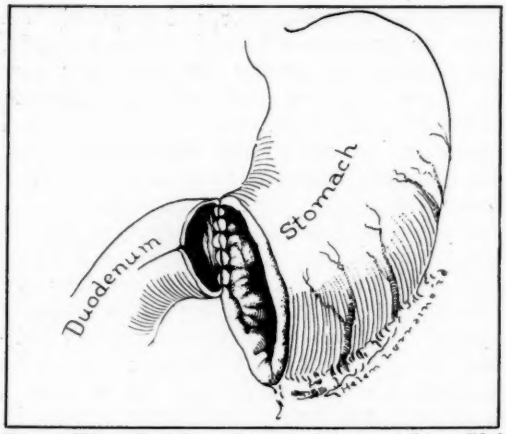

Fig. 1.—This outline shows the main features of the modified Billroth I described in the text. The anastomosis is made along the lesser curvature, which is the main axis of the peristalsis. An incision from an inch to an inch and a half is made in the anterior wall of the duodenum in order to flare it open and avoid constriction at the anastomosis.

In some cases in which a limited pylorectomy is done, the duodenum may be united to the whole caliber of the stomach, but as a rule this is unwise because a sufficient amount of stomach should be excised even with an ulcer in order to take in at least a portion of the cardiac portion of the stomach. The suture is continued over the rest of the gastric stump, merely approximating the margins.

Anteriorly, another suture begins above, with the knot tied on the mucous membrane, and is carried down as a baseball stitch, approximating the anterior margin of the stump of the stomach to the anterior margin of the stump of the duodenum. The baseball stitch has distinct advantages, not only in producing hemostasis and approximating the cut margins, but in avoiding leaving a ridge of tissue which occurs when a continuous lock-stitch is placed anteriorly. This ridge is sometimes

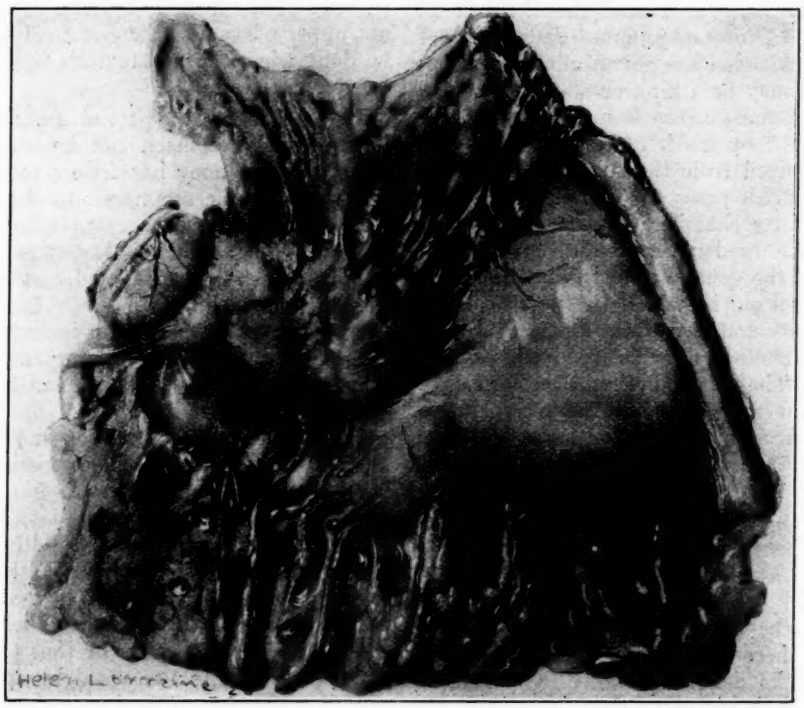

Fig. 2.—External view of specimen removed from patient, Mr. C. L. W. The cancer is in the pyloric portion of the stomach and appears as a firm, infiltrating, mass in the anterior wall.

inch or an inch and a half long is made in the anterior wall of the duodenum, so flaring it open and permitting several more stitches that unite the posterior wall of the stomach to the posterior wall of the duodenum. (Figure 1.) difficult to bury without inverting a large amount of tissue. This suture ends at the lower border of the duodenum. The teat left at the lower border of the stump of the stomach is inverted by a purse-string suture of OO tanned

catgut, and the end of this suture is continued anteriorly as a right-angle continuous suture, with back-stitches at intervals, burying the baseball stitch and terminating at the lesser curvature. One or two additional sutures of catgut are placed along the lesser border, drawing over the stumps of the gastro-hepatic omentum at this point. Some peritoneal covered fat is sutured over the region where the lower border of the duodenum joins the stomach.

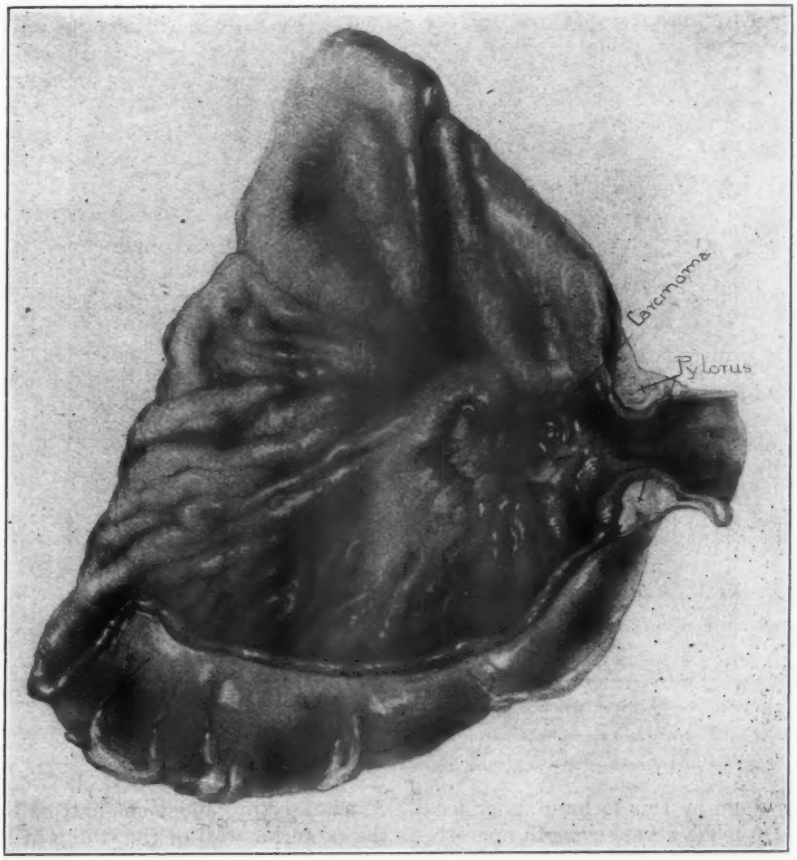

Fig. 3.—Internal view of the specimen shown in Figure 2. The ulcer is rather shallow with firm margins and the growth infiltrates extensively down to the pyloric sphincter. It has caused almost complete occlusion of the pylorus. The stomach was opened from behind so this drawing shows the pylorus to the right.

Since January 1, 1924, I have abandoned the Polya gastrectomy, and have been uniting the stump of the stomach to the duodenum. Since that time I have done fourteen partial gastrectomies. In three of them the stump of the stomach was united to the side of the duodenum, after mobilizing the duodenum, according to the technic devised independently by Finney and by Haberer. While these patients recovered, two of them had considerable difficulty in the stomach emptying. In eleven patients I have done the modified Billroth I, as described.

Of this total number, ten operations were for ulcer, one was for torsion of the gastro-hepatic omentum along the lesser curvature, and three were for cancer. All of the patients made a satisfactory operative recovery except one in whom there was very extensive cancer of the stomach with adhesions to the pancreas. After resecting the stomach, a portion of the pancreas was removed. The mass on the pancreas proved to be inflammatory infiltration, doubtless partly a saprophytic infection from the sloughing tissues of a very extensive can-

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cer of the stomach. Removing this portion of the pancreas stirred up the inflammation, activated the wound in the pancreas, and resulted in sepsis and death. In this case the operation was done under ethylene.

Another case of cancer of the stomach in a man sixty-nine years old with an aortic lesion was operated upon by this technic under local anesthesia. He made a very smooth operative recovery. His pulse during and after operation did not go over 90. For several months after leaving the hospital his condition was good, then metastases in the liver began to make their appearance and he died.

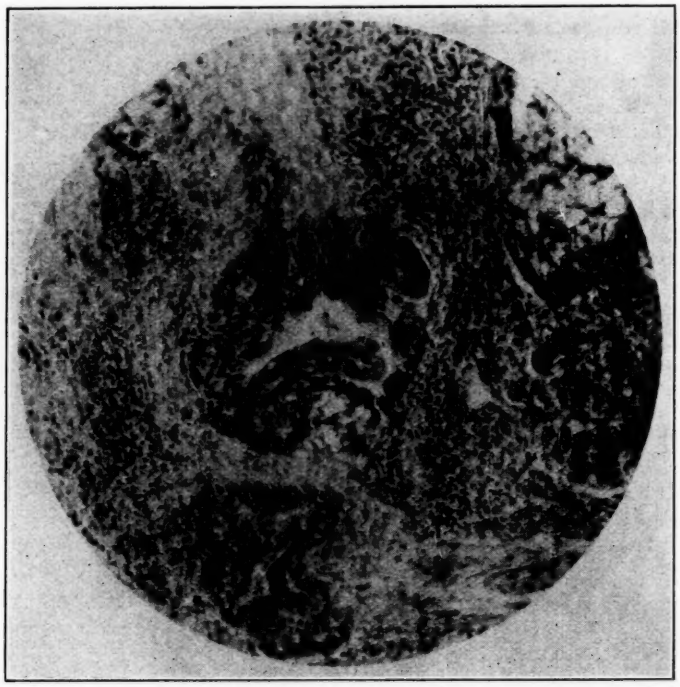

Fig. 4.—Photomicrograph of cancer of the stomach of Mr. C. L. W., shown in the two preceding figures. In the center of the photomicrograph is a mass of cancer cells arranged as an acinus. Some of the cells are fairly well differentiated. There are many layers in the acinus. In the lower right-hand margin of the picture some of the cells have undergone colloid degeneration. (X 150).

The third cancer case, Mr. C. L. W., age seventy-one years, was admitted to St. Elizabeth's Hospital on December 27, 1925. Roentgenologic examination by Dr. Wright Clarkson, of Petersburg, disclosed almost complete pyloric obstruction. After five days Dr. Clarkson still found about one-fourth of the barium meal still in the stomach. The patient appeared cachectic and his general condition poor. As the obstruction was almost complete, operation was undertaken with a view of doing a gastroenterostomy if exision was impossible The patient was operated upon on December 29, 1925, under local anesthesia. The stomach was washed out about two hours before the operation. The stomach was somewhat distended, but it was thought to be fluid and gas. After resecting about one-half of the stomach, the posterior wall of the stump of the stomach was united to the posterior wall of the stump of the duodenum. After packing around the tissues with moist gauze, the Payr clamps were released. The stomach at once poured out about a half-pint of thick fluid with lumps of solid material floating in it. It was expected that the gastric contents would be liquid and gas that could be readily drawn off with the suction apparatus. But as this could not be done, the stomach was emptied by scooping out the material with the hand. Though the surrounding tissues were well protected with gauze, infection was naturally feared. The rest of the operation was completed in the usual manner, local anesthesia being used

throughout. The patient's pulse was 72 at the beginning of the operation, and 80 at the end. At no time was it higher than 80.

The specimen consisted of the right half of the stomach and measured along the greater curvature 23.5 cm. About 2.5 cm. of duodenum was attached to the pyloric end of the stomach. In the anterior wall adjoining the pylorus was an infiltrating mass which within the stomach showed as an ulcer with firm margins and infiltration which produced almost complete occlusion of the pylorus. The ulcer was shallow, and the infiltration extended to the pyloric sphincter not only in the anterior

Fig. 5.—Roentgenogram of stomach of Mr. C. L. W., about three months after the operation. The picture was taken by Dr. Wright Clarkson a few minutes after the ingestion of a barium meal. The stomach is emptying along the lesser curvature and in six hours after the barium meal the stomach was entirely empty. The patient with ordinary diet has no gastric symptoms.

wall but along both the greater and lesser curvatures. Microscopic examination showed adenocarcinoma of moderate malignancy with some tendency to colloid degeneration. The lymph nodes along the greater curvature of the stomach in the specimen showed cancer. A few lymph nodes along the lesser curvatures were enlarged and soft and on microscopic examination showed mere hyperplasia without cancer. (Figs. 2, 3, and 4.)

The wound healed satisfactorily with the exception of a slight skin infection. The patient was discharged from the hospital on January 29, 1926. His temperature never rose above 99.5 during his stay in the hospital, nor was his pulse above 100.

This case is interesting because the age of the patient, the almost complete obstruction, the apparent cachexia, together with the presence of secondary anemia and a slight chronic nephritis, constituted what would ordinarily be considered an exceedingly bad risk. His general health now is excellent. He has no symptoms of stomach trouble, and eats average meals with comfort. He has gained sixteen pounds in weight. Dr. Wright Clarkson examined the patient roentgenologically on March 16, 1926, and reported that the remaining portion of the stomach is normal and the communication with the duodenum is functioning perfectly. (Figure 5.) After six hours the stomach was empty of the barium meal.

Too often cases of cancer of the stomach are abandoned as hopeless as soon as the diagnosis is made. A more careful consideration of gastric symptoms in persons "within the tropic of cancer" and a prompt exploration of any suspicious case will undoubtedly result in a cure of many of these patients who are now utterly abandoned.

617 *West Grace Street.*

THE FUNCTIONAL DISORDERS.*

By BEVERLEY R. TUCKER, M. D., Richmond, Va.
Professor of Nervous and Mental Diseases. Medical College of Virginia.

The question of whether true functional disease exists is an old one still under debate. In late years certain neurological diseases, paralysis agitans, chorea and epilepsy, for instance, have been transferred from the functional to the organic classification, while, on the other hand, the functional classification has been enlarged by the recognition of various conditions of psychogenic origin.

The discovery of endocrine dysfunction, the investigations in blood chemistry and the eradication of focal infections have tended to eliminate the old diagnoses of brain-fever, neurasthenia and reflex conditions, and changed our conception of many disorders of established diagnosis. The time has nearly arrived when we may be able to make an entirely new classification of nervous and mental conditions, but I have no intention of entering into any such ambitious program. I do consider, however, that it is important for all

physicians to attempt to obtain a general idea of the modern conception of what may constitute a functional disease or disorder. Only the osteopath and the chiropractor have the optimism to attribute "every ill the flesh is heir to" to a definite organic condition, and how comforting it must be to hang all these ills on a dislocated vertebrae!

Of the cause of three mental diseases, dementia praecox, paranoia and manic depressive psychosis, we know practically nothing except that Nolan D. C. Lewis has found underdeveloped circulatory apparatus in dementia praecox. As insanity is simply a departure in degree from sanity there are various shades of mental perturbation in developing or undeveloped stages of these three mental conditions for which we have no adequate organic explanation and which may be considered functional. The danger of a functional case developing into one or the other of these psychoses should always be borne in mind.

The modern release of restrictions on women, it would seem, should lessen the frequency of hysteria and other psychoneuroses though apparently it has not, but rather increased their frequency. This is due, we believe, to the fact that woman has suddenly, out of the suppression of the centuries, been brought to face phases in life and situations for which she has not only never been trained but hardly contemplated. What the eventual outcome will be it is hard to say, but there will be a good many years yet of attempted adaptation to these new responsibilities and situations with which many will be found unable to cope and to which they will react by various and sundry functional disturbances.

But to proceed, an organic disease is one that has a demonstrable pathological lesion and a functional disorder is one that has no pathological lesion. A man may claim, from a railroad accident, to have lost the use of his arm from a blow on his shoulder. If the injury is organic, there would be evidence of maceration of tissue and possibly external signs of trauma, and these might be accompanied by the subjective complaints of pain, numbness or anesthesia. If there was no evidence of injury, the loss of power, the pain, the anesthesia or what not, might be hysterical, due to subconscious autosuggestion. If the case was one of malingering, there would be a conscious assumption of these complaints, but back of this faking there is at least a moral defect which may, in turn, be due to, for example, a birth hemorrhage; in other words, the malingering might be due to a remote, though genuine, organic lesion. Any case which has a moral defect setting and an organic background is both difficult to fathom and to correct, but an attempt should be made. One of our cases, a boy of ten, whose school record had been poor, had encephalitis. After his recovery, he became brilliant in his studies, but began to lie and steal, which traits he had never exhibited before. He was arrested after having stolen a horse and buggy and sold it for ten dollars. We made the diagnosis of encephalitic adhesions to the frontal lobes and endeavored to induce two eminent brain surgeons to operate upon him. They both refused and the boy is now, though he probably has a helpable organic lesion, in a state reformatory.

It is well known that certain situations are such that they may cause reactions which so closely resemble organic symptoms that their differentiation is, at times, impossible.

An individual may be placed in a situation from which there is no escape and the situation may be so intolerable that he may react by having a convulsion. Just as business reverses, love affairs, domestic difficulties or the fear of disgrace may drive one to suicide as a means of escape, so similar situations may drive others to consciously or subconsciously seek their escape in narcotism, alcoholism, sensuality, dangerous adventure or crime; others may resort to the functional simulation of illness, paralysis or psychosis; others may exhibit a changed personality manifested by suspiciousness, seclusiveness, or indecision; others may get up an emotional instability shown by resentfulness, irritability, apathy, tantrums or tears. To illustrate, there is an unwritten normal reaction to every situation, and it is generally understood what an under- or over-reaction would be. If a man was to meet another who would call him a liar he could react by striking him in the face or by calling him another liar or something worse, either of which might be considered within the normal limits of reaction. On the other hand, if he were to swallow the insult and slink off, he would be under-reacting. while if he were to leave, obtain a pistol, lie in ambush and shoot the man who called him a liar, he would be over-reacting. About two

years ago we had brought into the sanatorium, six weeks after the birth of her last child, a woman with all the clinical appearance of a post-puerperal psychosis. She refused to eat or speak and lay in a fixed position in bed. After weeks of elimination and other treatment without avail, an investigation of her home life was made and it was found that she was doing all the housework, cooking and nursing for her four young children and two invalid members of the family. When it was told her that she was not physically ill but simulating death because she would not face her situation, and when she was promised that the invalids would be moved away and that she would have servant help, she promptly recovered and has remained well. Recently another woman with an over-taxing home situation was brought in with the diagnosis of tetany, but her attacks were in reality hysterical. These attacks ceased on the promise of relief in her home situation.

Just as a patient may develop a permanent habit spasm of the neck, of the face or of the eyelids, from the transient irritation of a frayed collar, an abrasion in the nose or a cinder in the eye, so may an inferiority complex, impotence or phobia develop from one punishment, one sexual failure or one fright.

An excuse or compensation complex, for instance when an individual substitutes some physical weakness or illness as an excuse or compensation for some situation or overt act or acts, may develop into syphilophobia, contamination fear or hypochondriasis. One woman, who did not care for her husband, vomited until she had the idea that she had serious stomach trouble. The vomiting was an excuse for not carrying on the functions of a wife. An estimable old maid, who in her youth committed a minor indiscretion, picked sores on her skin which she exhibited to various doctors as an evidence of syphilis. These cases are not unusual. Other somatic delusions and transferences may amount to hypochondria. Desire and wish complexes may have similar substitutions and transferences, a familiar example of which is the pseudo or hysterical pregnancy.

In view of the foregoing statements, it would be very hard to successfully contend that there is no such thing as a true functional disorder. It is not impossible for an organic disease to have an added functional feature. We recently had a case of hysteria under observation. Because of these attacks, the girl's father induced her fiance to break his engagement with his daughter. The girl became very indignant and she became so emotionally upset while writing a letter to her mother about it that she had a genuine epileptic convulsion. It was one of those rare cases in which both epilepsy and hysteria were present. Patients, at times, with organic lesions exaggerate their complaints to so great an extent that a portion of their symptoms become functional.

Certain personalities are much more subject to functional disorders than others. It is from the study of these personalities that much future knowledge is to come. Instances of domestic, sexual or financial difficulties, that may act as an inciting cause of a functional upset in susceptible people, may occur to all of us, but, fortunately, most individuals have a power of nervous and psychic resistance sufficient to enable them to combat, or adjust themselves to their difficulties. Those who are more apt to succumb to the exigencies of life are those who are sensitive, emotional, reserved, bashful, pampered, self-centered, self-conscious or over-consciencious, and those who are delicate, undernourished, anemic or who have sexual unbalance and the women who suffer from menstrual disturbance. Over-careful rearing, excessive religious exercises, lack of ordinary sex knowledge, improper dietary, restricted social intercourse, being an only child, lack of fresh air and exercise and inattention to bodily habits tend to create or accentuate this susceptible type of personality. Incomplete recovery from childhood or other diseases and inattention to focal infections are also important factors. Association with neurotics, over-study at school, excessive loss of sleep, improper reading, poor movies and unregulated parties also have an influence. But there may be, and I believe there is, in the majority of people who are susceptible to functional upsets, something deeper still than most of these things. There appear to be certain hereditary strains that produce individuals attuned to neuroses and psychoneuroses. Through some combination of protoplasmic elements, or constitutional disease, or improper body chemistry, or defect in brain tissue structure, there appear various types of personality who are candidates for functional diseases. This does not preclude, but rather confirms

the fact, that some of these types have a toxic, some an endocrine, some a disturbed visceral, and some an anatomical abnormality basic factor.

Cases with an hereditary potentiality belong to those families known as neurotic and tend particularly toward the various forms of hysteria. They have to be protected in one way or another by the more substantial members of the family and connection. With guidance and care they can usually go through some sort of hot-house existence and may be made limitedly useful and ornamental.

Those who have a disease or toxic basis need, of course, careful medical investigation and supervision in order to raise their physical status to as high a level as possible, and then the attempt should be made to eradicate their functional difficulties by psychic re-education.

A large and most interesting class is composed of those cases in which some endocrine or visceral disturbance is present. We can not here discuss these adequately. In these cases each ductless gland and each organ of the body should be carefully studied, and their disorders, if possible, corrected. The individuals in this group frequently develop neuroses and psychoneuroses of every variety. An endocrine change in development may upset the average bisexuality of an individual and change the personality. All human beings are bisexual, the male's feminine characteristics being shown by rudimentary breasts and certain similarities of the generative organs, and also by the fact that he can acquire certain feminine traits, sewing and cooking, for example, when necessity requires. The female has the rudimentary male organ in the clitoris, and may fight or attend to business if occasion arises. Through changes in the pineal, pituitary, suprarenal and the gonad glands, this differential proportion between the male and the female may lessen or change, and we may have, not only the masculine-woman and the feminine-man, both more susceptible than the normal type to functional disturbance, but we may have a variety of bizzarre and abortive types, two of which might be termed the girlish-boy-man type and the boyish-girl-woman type, which means not only a partial sex reversion but a preservation of infantile sex characteristics in both types. These individuals seem particularly inclined to phobias and complexes. Their adjustment to life consists chiefly in rearranging their environment so that they may fit into it without having to butt against its rough edges or stumble over its obstacles.

Of the last class, the brain defective, much more is known; they are more readily recognized and their mental difficulties may be more accurately measured. Their treatment is supervision, group discipline or institutional control, according to the degree of mental and conduct disturbance exhibited.

In conclusion, I should like to make the simple plea, when patients are brought to us with functional complaints, that we do not brush them aside, but that we delve deeply into the physical and psychic status of each case in order that we may, perchance, be able to so adjust their personalities that their lives may be made more tolerable for themselves and for those with whom they live and come in contact. To attempt this is, all things considered, an ambition worthy of the mettle of any medical man.

212 *West Franklin Street.*

PARALYSIS OF THE THIRD, FOURTH AND SIXTH NERVES FROM SPHENOID-ETHMOID DISEASE.*

By CLIFTON M. MILLER, M. D., F. A. C. S., Richmond, Va.

Reduction of the motility of the eye as a result of disease of the nasal accessory sinuses has received some passing consideration, but nothing like so much as has reduction of vision from the same cause. It is probable that the optic nerve is more frequently affected from this cause; at any rate, the patient is more able to appreciate the lessening of visual acuity even in one eye than he is a muscular imbalance when that imbalance is insufficient to cause diplopia. It seems to the writer highly probable that heterophoria is in many instances associated with nasal accessory sinus disease as a causative factor. As many cases of lowered visual acuity have responded to treatment of the nasal sinuses with complete return to normal vision, why should not the motor nerves be affected to a similar extent?

The course of the optic nerve through the optic foramen subjects it to pressure when for any cause the nerve swells or the lumen of the foramen becomes narrowed, and this is particularly true when the optic foramen is con-

*Read before the Richmond Ophthalmological and Otolaryngological Society, February, 1926.

genitally narrow. However, every case of optic nerve involvement is not due to pressure in the optic foramen in my opinion, but frequently is simply a toxaemia; and to this form of trouble the third, fourth and sixth nerves are subject, though they have not the narrow canal to pass, as a result of which they might likewise suffer pressure palsies. This does not apply to those cases where there is tumor or phlegmon of the orbit producing immobility and other symptoms indicating intraorbital pressure.

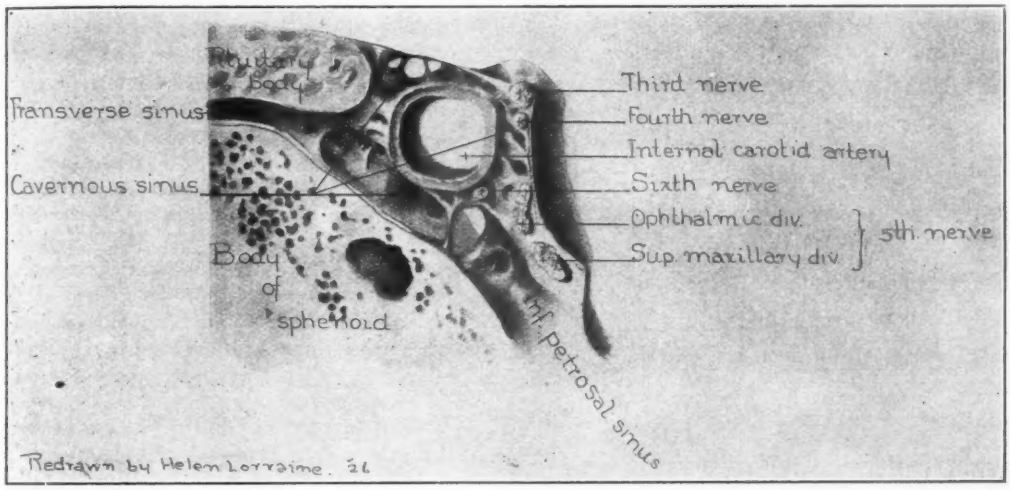

Plate 1.—Plan showing relative position of structures in right cavernous sinus viewed from behind. (Taken from Gray's Anatomy).

The causes of paralysis of the orbital muscles are many and, at present, the intracranial factors do not concern us. So far as my reading has carried me there is no indication that disease of the ethmoid has been given as a cause except in those cases where a phlegmon of the orbit results from the ethmoidal disease. The American Encyclopedia of Ophthalmology (Vol. XI, Page 8,140) says, "A cold contracted from undue exposure to dampness, to a draught, or any other causative agent, may cause, in some inexplicable way, paresis or even paralysis of any one of the ocular muscles." In the light of our present knowledge of foci of infection, the way such paresis or paralysis is caused is probably not quite so inexplicable. Fuchs speaks of rheumatic paralyses, as do most other authors, and we now search for infected foci when a diagnosis of rheumatism is made. The dictum of many syphilographers that paralysis of a single muscle or, single group of muscles is pathognomonic of syphilis should be remembered but not followed absolutely, for it has too many exceptions to be taken literally. But the possibility of syphilis as a causative factor should never be lost sight of. Be not too ready to prescribe antisyphilitic remedies where unable to find other causes in a chronic case, but do not fear to diagnose syphilis where your clinical symptoms justify it, even though all serological examinations are negative.

The symptomatology of complete paralysis of the muscles of the eye will be illustrated by the following case:

Mrs. J. S. E., white, female, age fifty-five, entered Stuart Circle Hospital July 13, 1925. General condition good, temperature 98.8°, pulse 76. Nothing in past history of any significance except had broncho-pneumonia six years ago, followed by septicaemia. Married, eight children, all well.

Present Condition.—In morning of July 5th, right eye began to ache and grew gradually worse. No flashes of light, and no diplopia at that time. Ache was continuous and interfered with sleep unless something to quiet her was taken. Has now great pain on right side of head. Complete ptosis of right lid, with no control of lid by voluntary effort. Physical appearance of right eye good. Eye immobile with pupil directed forward. No sign of motion as left eye moves. Pupil semi-dilated with no contractile response to either light or

accommodation. Exophthalmos very slight. Diplopia when eye-lid is raised with fingers. No fundus changes apparent. Visual acuity good. Fields appear about normal. Examination of nose shows thickened middle turbinate on right side with pus coming from beneath it, as well as on septal aspect. Neurological and serological examinations negative. Urine shows a trace of albumin and many oxalate of calcium crystals. Blood count was 6,000 whites, 68 per cent Polys.; lymphocytes, small 24 per cent, large 8 per cent. On July 17th blood count showed 17,000 whites, 74 per cent Polys., small lymphocytes 24 per cent, mast cells 2 per cent. Examination of pus from nose showed staphylococcus albus.

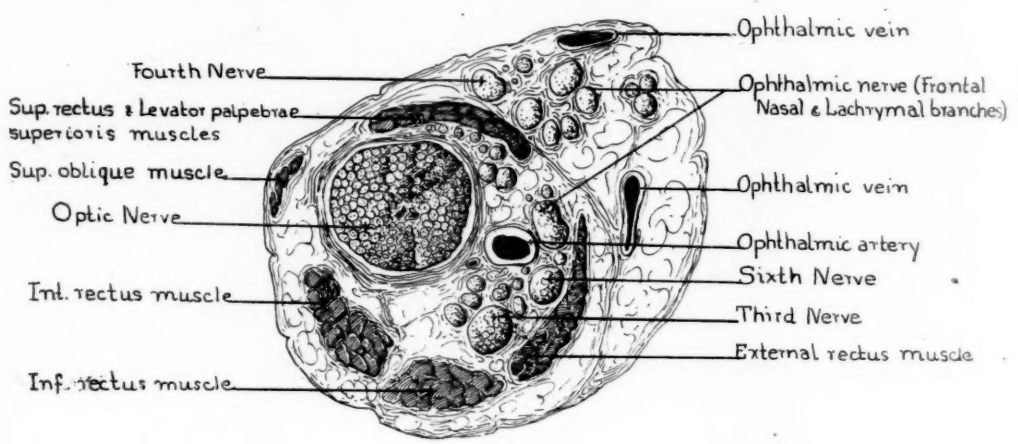

Plate 2.—Section through contents of right orbit 1-2 mm. in front of the optic foramen, viewed from behind.—After Lange. (Taken from Morris' Anatomy).

Treatment by shrinkage and suction for a few days was tried, but getting no improvement and it being necessary to continue use of opiates for pain, operation on ethmoid was advised and accepted. On July 18th, under local anaesthetic, right middle turbinate was removed and sphenoid and ethmoid drained. Much pus was found. The ethmoid was full of soft granulation tissue and pus. Relief from pain took place in twelve hours, and after twenty-four hours patient had to take no more opiate. Was discharged from hospital July 23rd feeling perfectly well as far as pain was concerned, but no change in condition of eye muscles. Patient reported for local treatment every three or four days. About August 10th some slight downward movement of the eye could be noticed. From this time on there was a gradual improvement in the motility of the eye until about December 1st there was complete restoration of movement in all directions except upward. Movement upward takes place, but is somewhat restricted, and diplopia begins to manifest itself when extreme upward rotation of eyes is attempted. Ptosis is entirely absent and there is no diplopia in any other position of the eyes. She looks perfectly well and says she feels well in every way, being able to do anything she wishes to.

A diagnosis of toxic paralysis of the third, fourth and sixth nerves was made, as there could be no other arrived at with the symptomatology found. Paralysis of these three nerves as a result of some central lesion of the brain would necessarily have involved other cranial nerves, particularly some involvement of the motility of the other eye.

Cavernous sinus thrombosis is always to be thought of when such paralysis occurs. It seems to be, however, an impossible diagnosis in the case above reported, though the involvement of the ethmoid and sphenoid might easily have caused phlebitis of the opthalmic vein

with a cavernous sinus thrombosis resulting therefrom. However, there was no injection or edema of the conjunctiva at any time, and exophthalmos was present only in the slightest degree. The opposite side never showed any indications of involvement of the cavernous sinus. It seems hardly possible that the cavernous sinus of one side could be thrombosed without the other side becoming involved.

An inflammatory infiltration of the muscles producing complete paralysis would have occurred at the tip of the muscle cone, if such could have occurred. This would have left the inferior oblique unimpaired and the eye would have been moved by it, which was not the case. Had the paralysis been due to some pathology of the muscles, the sixth nerve would have been left unimpaired and the pupil would have responded to the stimuli of light and accommodation. It was entirely immobile. Tumor or phlegmon of the orbit producing sufficient pressure to cause immobility of the eye would have produced marked exophthalmos with later conjunctival injection and edema.

Finally, the diagnosis arrived at seems to have been confirmed by the fact that cure followed and, in my opinion, resulted entirely from drainage of the ethmoid and sphenoid.

Stuart Circle Hospital.

THE BEDSIDE STUDY OF THE CIRCULATION IN ACUTE AND CHRONIC INFECTIONS.*

By GARNETT NELSON, M. D., Richmond, Va.
Department of Medicine, McGuire Clinic, St. Luke's Hospital.

It is a good thing now and then to take stock of our daily work, and see to it that we are making full use of our ordinary routine observations. This business of taking stock of ourselves is necessary in order to be able to avoid carelessness and indifference and at the same time increase our ability to measure and interpret the significance of available data. Following an established plan and custom of occasionally reviewing the value of professional habits, this paper was prepared for my own use, and I am taking the liberty of presenting it because the time and thought required in writing it out did not seem entirely wasted.

In our ordinary daily work we constantly approach the bedside of patients ill with acute or chronic infections. We look at the tongue, take the temperature, feel the pulse, and perhaps take the blood pressure, examine the heart, and really study the circulation. It is possibly true that the most common observation we make is to feel the pulse, and it is equally true that we have to consciously guard against doing this in a haphazard and uninforming fashion.

In all acute or chronic infections a rather complete study of the circulation is essential. No diagnosis is finished without a prognosis, and in many infections the final outcome depends on the patient's endurance, and this in turn on the circulation. This dependence on what the circulation can endure not only affects the immediate result, determining whether or not the patient will survive, but in those cases that recover, the completeness of their recovery, that is their functionating capacity, depends very directly on the amount to which the circulation is crippled during the activity of an infection, or of equal importance during convalescence.

It is only practicable to consider in detail some of the infections, and particularly those that have a definite effect on the heart muscle or the circulatory apparatus as a whole.

The questions that interest us in the beginning, therefore, relate to the effects various infections may have on the circulation, and our ability to recognize these effects at the bedside. In general, these effects may be classified as follows:

1. Actual secondary infection of the muscle, valves or membranes.
2. Hyaline degenerative changes in the muscle.
3. Degenerative arterial processes.
4. Heart strain and exhaustion from prolonged rapid action.
5. The more or less material changes in other organs due directly to a failing circulation.

In regard to actual secondary infection of the muscle, valves or membranes, certain controlling factors contribute especially to the frequency of these infections. These are particularly age, and the specificity of certain organisms. In regard to age, the liability of the heart muscle, valves or membranes to secondary infections depends to no small extent on the age of the patient, particularly in the infectious diseases of infancy and child-

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hood. And there is something more to this than the mere fact that these infections are more prevalent during infancy and childhood than at later periods of our lives. It is apparent that the resisting power of the cardiac structure to direct infection is not as well developed during the early periods of our lives as it is later. For example, chorea, tonsillar infection and rheumatic arthritis are complicated or followed by endocarditis, myocarditis, or pericarditis in inverse proportion, in their frequency, to the age of the patient. The very young show such complications or sequelae very frequently,—the aged very rarely. This fact is overlooked too often, and relatively trifling and easily curable involvements of the circulation are allowed to leave some permanent defect. In all infectious processes, particularly in the young, the circulation should be watched until a guarded convalescence permits a clean bill of health.

Next to age as a predisposing factor, the nature of the infection itself enjoys a position of commanding importance. Although gonococci, diphtheria bacilli, tubercle bacilli and many other organisms may occasionally become lodged and set up true areas of infection, they are not liable to do so, and even when positive complicating infections do occur during the course of an acute gonorrhea, diphtheria, etc., the micro-organism found in these secondary localized areas is some form of streptococcus or staphylococcus.

Of course, the most frequent infectious process to be complicated by cardiac infection is rheumatic arthritis, being responsible for approximately 40 per cent of all true infections of the circulatory apparatus, and we must bear in mind that the frequency of these secondary infections does not depend on the severity of the joint infection, mild cases being as much to be feared as the most severe.

In addition to the infections mentioned, any of the specific fevers have to be watched. Osler reports five instances in 100 post-mortems for pneumonia, and twelve instances in 216 post-mortems on phthisical subjects.

The most common pathology to be found is hyaline degenerative changes in the heart muscle. This is, of course, not due to actual infection but to degenerative processes depending on prolonged fevers or biological toxemias. These hyaline degenerative processes occur frequently during the pneumonias, typhoid fever, osteomyelitis, tuberculosis or any suppurative process. They are far less graphic than the direct infection, recognized with more difficulty, and, therefore, even more frequently overlooked.

The arterial degenerative processes consist of nothing more nor less than the athero or sclerotic changes which are to be expected as a result of prolonged chemical or biological toxemias. Under the general subject of this paper, we would, therefore, expect these arterial changes chiefly in chronic malaria and syphilis, particularly the latter.

The fourth pathological condition mentioned in our classification was "heart strain and exhaustion from prolonged rapid action." In the strictest sense this is hardly a true pathology, inasmuch as there is neither a direct infection nor a hyaline nor fatty degeneration, but the muscle fibres become stretched, causing dilatations, or lose tone, impairing one or more of their special functions, such as conductivity, tonicity, contractility, etc.

Although true pathological changes may not be present, it is not to be inferred that permanent injury is only infrequently the direct result of such strain or exhaustion. On the contrary, we frequently see patients suffering from the so-called weak heart, which bears a definite association with some of the acute infections. In addition to those infectious processes which have been mentioned earlier in this paper, possibly the most frequent cause of this particular type of heart trouble is the "flu." It has been a common observation that cases of rapid heart action, dyspnoea on slight exertion, and a sensation of being too easily fatigued, or a definite precordial oppression were encountered following our recent epidemics of the "flu," especially in those cases in which a too rapid convalescence was attempted.

The fifth effect to be considered is the more or less material change in other organs due directly to a failing circulation. The most conspicuous of these are cerebral anemia, pulmonary congestions, congestions of the liver, kidneys, and of the gastro-intestinal tract, with nausea and vomiting or obstinate diarrhea. It is an interesting phenomenon, for example, to see obstinate diarrhea in patients convalescing from typhoid, promptly relieved by improving the mechanism of the circulation.

So much then, very briefly, for the general

effects of the infectious diseases on the circulatory apparatus.

The ability to recognize these effects is so common to all of us, that our success is more a matter of painstaking observation than of knowledge. Still, in the hurried work of a busy professional life, we do fail to make these observations with regrettable frequency, and it is not to our credit to so often see reports of cases of sudden death in adults or children following an acute infectious disease. We hear too often that so-and-so had pneumonia, for example, and was about well, when on making some trifling exertion he collapsed and died in a few minutes. The truth of the matter generally in such cases is that the patient was by no means about well, but was still suffering from a simple endocarditis, hyaline degeneration, or heart strain, from which he might have recovered.

So, then, as was said above, we should form and stick to certain professional habits, and when we are at the bedside of a patient suffering with an acute infection, we should ask ourselves several direct questions. These several questions relate particularly to the heart sounds, the size of the heart, the rate, rhythm and volume of the pulse, and the blood pressure.

In regard to the heart sounds, time does not permit a full discussion of the significance of murmurs. Suffice it to say that any abnormal new sound, or any modification of the length, quality, or intensity of normal sounds, calls for careful and prolonged observation. We have to determine from our own experience what sounds mean to us. We have to have opinions of our own.

Feeling that this is axiomatic, that we must have our own opinions, I hope that I will be pardoned for opposing a teaching in regard to the significance of the systolic apical murmur that has appeared in text-books and journals during the past few years. In Cabot's "Physical Diagnosis," under the heading—"The Question of Mitral Regurgitation in Early Rheumatic Mitral Disease,"—we find as follows: "Such murmurs are no evidence of disease." * * *. "Early coxcomb vegetations may hold the valves apart so that they cannot close. Relaxation of the papillary muscles or shortening of tendinous cords may well permit a reflux. Muscular weakness may weaken the sphincteric action of the circular fibers about the base of the leaflets so that they do not fill up the mitral orifice."

In my opinion for what it is worth, this teaching may lead to serious error. It may be all right to say that such murmurs do not define the exact nature of a valvular or muscular lesion, but if we are watching at the bedside of an acute infection, and are willing to pass up systolic apical murmurs as having no significance, we will undoubtedly be responsible for permanent cardiac damage or even death that might be prevented. This is especially true, to repeat myself, of children during or ofter a chorea, tonsillitis, or rheumatic arthritis.

Indeed, I think that Cabot expresses himself somewhat better when, in his section on "Late Mitral Disease—Stenosis," he states that "In the early stage at which the stenosis can be recognized with certainty, there are no abnormal signs when the patient is at rest except a systolic murmur."

The rate, rhythm and volume of the pulse are not only significant in measuring the seriousness of an illness, but may be used as a guide in helping us to determine the nature of the invading organism. This seems to me to be especially true of three organisms, the pneumococcus, the meningococcus, and the tubercle bacillus. In the presence of a pneumonia, a slow, full, bounding pulse indicates a pneumococcus, whereas, a soft, rapid, watery pulse indicates one of the numerous organisms that cause broncho-pneumonia. Infection with a meningococcus meets with a response very similar to that of a pneumococcus, that is a slow, bounding pulse of wide volume. In the presence of a tubercular infection, a rapid, watery pulse of poor volume is an ominous sign.

In the presence of or following any infection, a rapid, watery pulse, or a pulse that responds too greatly to exercise and fails to slow down promptly, points very definitely to involvement of the heart muscle.

Observations of the size of the heart are, of course, imperative. A sufficiently accurate observation may be made by noting by palpation the position of the apex impulse. The only precaution that is necessary is to remember that the heart changes its position markedly with change of posture, and to see to it that our daily records of the position of the apex impulse are made under the same

conditions of posture and respiration. If, in the course of or following an acute infection, the apex impulse moves downwards and outwards appreciably, weeks or even months of rest in bed are indicated in the hope that the apex impulse will return to its normal site.

Just here I wish to mention a very practical use of the sphygmomanometer,—I mean as an aid in recognizing arrhythmias. Bedside studies of arrhythmias are made in three ways, first, by feeling the pulse; second, by a combined feeling of the pulse and use of the stethoscope over the heart's apex; third, by the use of sphygmomanometer. The simplest method is by feeling the pulse, and the more common arrhythmias are easily recognized. The combined feeling of the pulse and use of the stethoscope enables us to recognize the little extra beats that have not enough force to throw an impulse through to the wrist, that is a pulse deficit. With the sphymomanometer, we are able to recognize those arrhythmias that are irregular in force only. Each cardiac impulse may give a pulse at the wrist and they may all come through at properly spaced intervals, but their force is varying and, perhaps, varying so slightly that neither the finger nor the stethoscope can appreciate it. If, now, we attempt to take the systolic pressure and pump in sufficient air to shut out all sounds below the cuff, then let air escape until the first audible sound gets by, then hold your pressure at this point for one or two minutes, it may be easily observed that either some ventricular contractions fail to force by any sound, or else the sounds are varying decidedly in intensity. By this means, we can easily see that we have a definite arrhythmia as far as the force of each ventricular contraction is concerned. I believe that the development of these arrhythmias is of even more significance than excessive rapidity of action. If, for example, in the pneumonia of the aged, while observing the systolic pressure, I detect an early arrhythmia in force, I feel warranted in giving a prognosis of a fatal termination.

In order to bring this cursory discussion of this vitally important subject to a conclusion, I wish to speak briefly of the prognosis and the methods at our disposal for combating these disorders of the circulation.

Of course, our sheet anchor is prolonged rest, mentally and physically, for the purpose of saving the heart every possible contraction. In the direct infections, except in the very young, our efforts at preventing some permanent crippling are doomed to meet with but poor success at best. Many cases of simple endocarditis, especially those complicating rheumatic arthritis, will make a more or less complete recovery. In the very young they will frequently get entirely well.

All cases of malignant endocarditis die. This is so absolutely true that if we have made a diagnosis of malignant endocarditis and the patient recovers, we must change our diagnosis.

Many cases of hyaline degeneration properly handled make complete recoveries.

All cases of heart strain or exhaustion should get entirely well, the heart muscle possessing, as we know, a recuperative power beyond that of any other portion of the body.

The effects of failing circulation on the other portions of the body, such as the brain, lungs, liver, kidneys, etc., can be relieved in direct proportion to our ability to restore the tone of the circulation. These secondary effects, however, of themselves further embarrass the circulation and special means must be adopted to relieve the processes going on in these more distant organs.

The best illustration of what I mean is pulmonary edema. Here, although the edema is directly due to cardiac failure, it of itself increases the cardiac embarrassment. I report one case briefly. Mrs. B., white, female, age sixty-seven, was ill of lobar pneumonia and on the eleventh day collapsed, in spite of the usual efforts at support. When I reached her bedside, a few minutes later she was cyanosed, pulseless, unconscious, cold, clammy, her pupils dilated and death seemed imminent. A rapid examination showed pulmonary edema involving not only the pneumonic lung, but the other as well. Using a pocket knife, a vein was opened and about sixteen ounces of blood taken. The response was prompt and recovery complete.

In addition to rest in bed, we should, of course, employ in the infections, any specific treatment at our disposal. I refer here, of course, to antitoxin in diphtheria, quinine in malaria, mercury or salvarsan as indicated, and dependable vaccines.

Aside from rest and specific medication, our

most helpful drugs are, in the order named, digitalis, caffein, atropin, spartein, strychnin.

The only comment I wish to make in reference to digitalis is to emphasize what I believe to have been definitely proven in the last few years. Our results from digitalis have been unsatisfactory for two reasons: First, the use of unreliable preparations, and, second, insufficient dosage, no matter what preparation used. In the past two years, we have learned that instead of attempting to get results with the equivalent of one grain of the powdered leaves, we should not use less than the equivalent of from four to six or eight grains, the proper initial dose of a reliable tincture being, therefore, not fifteen drops, but from one to two drams.

Caffeine will not by any means replace digitalis, but is, possibly, especially indicated, as suggested by Forchheimer, in those cases of lost circulatory tone where abdominal tympanites is a troublesome symptom. In my own practice, I only use caffeine for routine treatment in those patients, especially the aged, who are accustomed to and are more or less dependent on coffee. This is not a point of minor importance. Old people, accustomed to several cups of coffee daily, when ill, need caffein just as distinctly as those who are accustomed to whiskey, when ill, will die if deprived of their whiskey.

The indications for the use of atropin are fairly definite. It should be used in that group of cases where the circulatory disturbances, such as fluctuating blood presure, alternate flushing and pallor, or other symptoms, indicate vagotonia. The result in this group of cases from the use of atropin in large enough doses, such as 1/50 of a grain hypodermically every four hours, are quite as graphic as a speedy response to properly used digitalis.

Spartein is reputed to have a special action on the right side of the heart and to act as an excellent diuretic. Personally, I have never been sure I saw it do anything.

Strychnin has no place in the management of circulatory disturbances except to the extent that it acts as a general muscular tonic.

In all cases where rapid heart action is a conspicuous feature, the ice-bag over the precordium is indicated.

LOCAL ANESTHESIA.*

By WILLIAM B. MARBURY, M. D., Washington, D. C.

Local anesthesia may be said to date from 1884 when Koller announced that a few drops of a 2 per cent solution of cocain placed on the conjunctival sac made the eye insensitive to pain. This, with the discovery and use of adrenalin chloride as an adjunct, forms the background of the present day use of local anesthesia. It is interesting to note that ether anesthesia preceded the use of local by forty-two years.

The term is usually understood to mean the absence of pain over a smaller or larger area, and is used in contra-distinction to general anesthesia or narcosis. When used in the broad sense, it would include spinal, regional, and induction anesthesias, though it is more frequently applied to the latter. The dividing line between local and regional anesthesia is an indefinite one, as local anesthesia is regional over a small area, and regional anesthesia is local over a large area. Local anesthesia is accomplished by ethyl chloride spraying, osmosis or by infiltration. The ethyl chloride spray causes anesthesia by freezing the area. The freezing itself is quite painful and the frozen area is made hard and difficult to incise. The principle of osmosis is taken advantage of in anesthetizing the mucous membranes and the conjunctiva. The agent most frequently used is cocain in from 1 to 10 per cent solution. It should be used with adrenalin to diminish absorption, and with great care because of possible idiosyncrasy of the patient to the drug.

Infiltration anesthesia is the one most commonly used and has the widest application. It consists of injecting the anesthetizing solution into the tissues direct and bringing it into relation with the nerve terminals, rendering them functionless. An area may be anesthetized by blocking the nerve that supplies it. This may be accomplished by injecting the nerve itself (endoneural) or by infiltrating around it (paraneural).

A number of drugs have been used for local anesthesia, such as cocain, stovain, quinin and urea, novocain and numerous others, but practically all have been placed in the discard in favor of the last named. This is for several reasons, namely, novocain gives the greatest

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amount of anesthesia for the least toxicity; it can be sterilized by boiling; it can be put up in tablets with the required amount of adrenalin and easily made up with isotonic salt solution into the desired strength. Adrenalin used in this way is staple, whereas in solution it deteriorates. Tablets marked "A," containing 0.125 grams of novocain and 0.000125 grams of suprarenin, are conveniently supplied in vials by the Metz Laboratories. One tablet dissolved in 25 c.c. of normal salt solution makes a strength of one-half of one per cent. Isotonic salt solution should be used as the vehicle. It is less irritating to the tissues and less painful. The tablets should be sterilized by boiling just before using, and normal salt solution added as required. The only cumbersome part of the technic is the preparation of the salt solution. This should be carefully made in advance and autoclaved for at least thirty minutes at twenty-five pounds pressure.

The patient should be prepared as he would be for a general anesthesia except that coffee and toast may be allowed for the morning meal. As to whether or not morphine should be given will depend upon the operator's individual experience. Morphine increases the chance of nausea following the operation, but lessens greatly the anticipation on the part of the patient, and in nervous individuals is of decided benefit. Crile states, "under the influence of morphine and scopolamin no one is a coward, no one is brave; every one is in a neutral state." It is important to take the patient into one's confidence, forewarning him of a twinge where it can be foretold. It is well to have a psychoanesthetist constantly with the patient, who will give encouragement and reassurance. Iced cloths on the forehead are a solace. Sometimes a cigarette is a boon.

The choice of an anesthetic may be of considerable importance and have a far-reaching effect. The patient may have a decided preference as to whether or not he wants to be present at his own operation. Sometimes prejudice may be overcome by a persuasive surgeon. Local anesthesia has its greatest usefulness in minor surgery, but there are few fields that have not been explored by the "local" enthusiast with his "piqure." It may be the anesthetic of necessity in the aged or those weak and debilitated from disease. There is practically no mortality *per se*. It has been said that there is more chance of infection under local than general anesthesia. The operative field is practically bloodless and voluntary action on the part of the patient may give material aid.

The armamentarium for local anesthesia is simple. One should have at least two 10 c.c. record syringes with needles of small calibre and different lengths. An alcohol lamp is convenient for sterilizing the novocain tablets. They should be boiled with a small amount of normal salt solution and this diluted to the required strength. The salt solution should be isotonic and sterilized in advance in an autoclave.

Considerable minor surgery can be done in one's office by using local anesthesia, which would be impossible without it. Wens or other small tumors may be removed from nearly any part of the body. Abscesses or infections may be opened and drained if the precaution is taken not to inject the anesthetizing fluid primarily into the inflamed area. Thrombosed external hemorrhoids may be incised and the clots turned out. These are only some of its applications. When anesthetizing a lacerated wound, preparatory to suture, it is important not to inject through the skin but into the incised area. This is both less painful and easier to accomplish.

Because general anesthesia is so safe and satisfactory when administered by those competent to give it, local anesthesia has been considered by many to be indicated only in minor work. This is hardly true, as the works of Braun, Sherwood-Dunn, Allen, Labat, Finsterer and many others testify. While it remains the *sine qua non* for minor surgery, it is able to take up the burden of larger fields when necessity beckons. In the following paragraphs, I will attempt to show briefly the scope of local anesthesia in major surgery.

On the head, most traumatic surgery can be accomplished under local. Cushing has said that any patient whose head can be shaven without a general anesthesia can be operated on under local. Of course, if the patient is irrational and uncontrollable, narcosis is necessary. Some of these patients are comatose and require very little anesthesia except to prevent further shock. It is well to remember that the nerve supply of the scalp comes from below and is supplied by the three branches of the trigeminus and the cervical plexus. The

skin and periosteum are the only sensitive parts, the bones and dura being insensitive. Osteoperiosteal graphs may be switched to replace bony defects. I have done them on two children, ages nine and fourteen, respectively. Brain tumors have been successfully removed under local anesthesia.

In the neck, operations about the mid-line are satisfactorily done, such as tracheotomy, laryngotomy, thyro-glossal cysts. In thyroidectomy, there is almost inevitably some pain when the lobe is displaced forward; therefore, the anoci-association of Crile, i. e. combination of gas-oxygen and local had best be used.

The chest is a fertile field for local anesthesia. Surgery here is often necessary where there is already embarrassed respiratory function and a general anesthesia is contra-indicated. Pleurotomy may be done by the open or closed method, rib resection, or the more deforming operation of Schede. For an intercostal opening or the resection of a part of one rib, local infiltration is sufficient, but if more than one rib is to be resected, the intercostal nerves should be infiltrated. These nerves are found at the lower border of the ribs at the costal angles.

With the exception of herniotomy, which local anesthesia may almost be said to claim as its own, most operations which entail opening the abdominal cavity are done under general anesthesia. This is for several reasons. The parietal peritoneum is very sensitive and hard to anesthetize; there is danger of the patient straining and extruding coils of intestine; traction, incident to widening the incision, is difficult and any tug on the mesentary is resented by the patient. In spite of all these difficulties, when necessary, an appendix can be removed under local anesthesia, or a gall-bladder drained. Not infrequently a coil of intestine is brought to the surface and a catheter placed in the lumen to relieve obstruction. Farr goes so far as to state that for the last ten years he has used local anesthesia in over 90 per cent of his gall-bladder cases, regardless of the type, and in over 97 per cent of his appendix cases, regardless of the stage of the disease or the age of the patient. He uses the infiltration block for the parietes and anterior splanchnic or sympathetic anesthesia when once in the abdomen.

Operations about the rectum and perineum may be done by infiltration or caudal block, and the latter plus para-sacral anesthesia will permit of a painless cystotomy or prostatectomy.

The upper extremity may be anesthetized by infiltrating around the brachial plexus in the neck, or by exposing the main nerve trunks below the insertion of the pectoralis major muscle and injecting endoneurally. In the lower extremity, the great and lesser sciatic in the back of the leg, and the external cutaneous, the anterior cural, and external obturator nerves in the front, should be carefully mapped out and infiltrated. I have amputated above the knee for gangrene in a diabetic after so doing.

No effort has been made in this brief discussion to compare the relative merits of regional and simple infiltration anesthesia. Indeed, there should be no quarrel between the advocates of either, but the one made to supplement the other. Labat has done much to bring the former into the limelight.

In closing, let me emphasize the importance to the surgeon of qualifying as fully in this method of administering anesthesia as the professional anesthetist has done in the administration of general anesthesia. Not until then will it be used to the fullest advantage.

1015 *Sixteenth Street, N. W.*

THE TREATMENT OF ECLAMPSIA.*

By M. PIERCE RUCKER, M. D., Richmond, Va.

The treatment of eclampsia produces a lively discussion among medical men for many reasons. In the first place, the disease itself is so dramatic, with a high immediate mortality both for the mother and child and not infrequently lasting sequlelae in the mothers who survive the convulsive seizures. In the second place, there is no specific or satisfactory treatment, which leaves room for a multitude of treatments, all of which have been of some service in various circumstances. In the third place, the disease itself varies greatly in its severity, which adds confusion in the evaluation of any method of treatment. Until we have a more definite idea as to the cause of eclampsia, we can not hope to be logical in our therapeusis. The best we can do is to treat our patients empirically, choosing those remedies that give the best results. Even this is not so simple as it sounds. The

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facts, uncolored by over-enthusiasm for some particular drug or scheme of treatment, are hard to get, and it is becoming increasingly difficult to get enough clinical material to form a judicial opinion. Dr. Ross McPherson illustrates this well. In 1909 he wrote strongly advocating cesarean section as the treatment of eclampsia. He reported a maternal mortality of 25 per cent and was proud of his results. When reports of the Stroganoff and the Dublin methods began to appear in the literature, it was determined at the New York Lying-in Hospital to try the conservative plan. All the eclamptics entering the service were put in Dr. McPherson's charge and he was to report when he had treated 200 cases in this manner. In the meantime there was a great increase in the activity of the prenatal clinic, and Dr. McPerson has never completed his series. To date* he has had only 190 cases. He has, however, become a convert to conservatism in the treatment of eclampsia.

The treatment of eclampsia naturally divides itself into prophylactic treatment, treatment of the patient with eclampsia, and the subsequent treatment. The prime essential of prophylactic treatment is prenatal care. In the light of our present knowledge this need not antedate conception although, when McQuarrie's work on the possible agglutinating effect of fetal serum upon the mother's blood appeared, it looked as if the supervision of marriage might become the province of obstetricians. In fact, Gruhzit read a paper before the American Association of Obstetricians, Gynecologists and Abdominal Surgeons entitled "Is Eclampsia A Biological Necessity?" His argument was that if the parents belonged to the same blood group, the offspring would of necessity inherit the same blood characteristics and there would be no danger of eclampsia. Unfortunately for the eugenically inclined, McQuarrie's results have not been confirmed. For instance, a recent study from Stoeckel's clinic at Leipzig upon 302 pregnant women and 250 newborn infants shows a difference of blood group in 26.4 per cent. There were twenty-two cases of toxemia in this series with a difference of blood grouping between the mother and child of 32 per cent. In twelve cases of eclampsia the blood group of the child was the same as that of the mother eight times.

So, for the present, let us begin our supervision of the prospective mother early in pregnancy. The technic of prenatal care is now so well known that I need not go into that. Our preventive eclamptic treatment should begin whenever the blood pressure begins to rise. If we wait for confirmatory evidence of toxemia in the shape of albuminuria and changes in the eye grounds, you wait until permanent damage has been done, and if you wait until such symptoms as headache, dizziness, and gastric disturbances appear you often wait too long to prevent eclampsia. The patient, with a rising blood pressure should be put to bed, her diet should be restricted to carbohydrates, the alimentary tract cleaned out and fluids should be forced. If the blood pressure falls, the patient should be carefully watched for a recurrence, when the same treatment is to be instituted. If the blood pressure does not fall under such treatment, then interruption of pregnancy should be seriously considered. One of the most unexpected findings in a follow-up study of the toxemias of pregnancies at Johns Hopkins was that toxic cases in which eclampsia was prevented showed a much higher incidence of kidney impairment than the eclamptics. Harris explained this incongruity on the basis of the time element. The toxic cases that did not have convulsions were carried along in the interests of the child and toxic agents acted for longer periods of time, often for weeks, whereas, the eclamptics were subjected to the effects of the toxemia for much shorter periods of time. The question naturally arises, are we justified in subjecting our patients to this very real risk of having a chronic nephritis for the sake of having a full term child whose chances of surviving even then are definitely impaired. It is a question I believe that should be put plainly up to the mother. Unless she is willing to assume this risk, I believe pregnancy should be terminated. If she elects to go on with the pregnancy, her wishes should be obtained in writing, otherwise, a consultation should be had, for the protection of the doctor.

The treatment of the case with actual eclampsia unfortunately cannot be disposed of so easily. The first requisite is the willingness and the ability of the medical attendant

*Dr. McPherson discussed this question at a clinic before the Obstetrical Section of the Southern Medical Association, in November, 1925.

to be with the patient all the time. The general principles of treatment can be outlined, but the details must be varied to fit the individual patient, and such requires constant supervision. The best obstetric opinion is rapidly going over to the conservative method of treatment. The report of the London Committee on eclampsia of the Third British Congress of Obstetrics and Gynecology gives a good idea of the relative value of the various modes of delivery. In the first place, this committee attempted to classify eclampsia clinically. They regard the following seven phenomena as signs of danger: coma, a pulse rate over 200, a temperature above 103, a number of fits greater than 10, a urine that becomes solid on boiling, the absence of edema, and a blood pressure above 200 m.m. When a patient has any two of the above phenomena, the case is classed as a severe one. The committee gives the following table of the results obtained in the various London Hospitals:

Mode of delivery	Mean mortality	Mortality mild cases	Mortality severe cases
1. Natural delivery	12.3%	6%	20.5%
2. Induction of labor and spontaneous delivery	9.6%	5.1%	20.8%
3. Assisted delivery	14.5%	5%	33.3%
4. Cesarean section	23.8%	9.8%	37 %
5. Accouchement force	50 %	25 %	60 %

If pregnancy, as undoubtedly it is, be the prime requisite for eclampsia, it would seem logical to end the pregnancy as quickly as possible. These patients, however, are bad surgical risks, and the less they are disturbed the better the results. Stroganoff, whose wonderful results have attracted world wide attention, and also considerable skepticism, insists that the patient be treated in a darkened room free from all noise. He even anesthetizes his patients whenever a hypodermic is given. All of us, I am sure, have seen a loud noise or the jarring of the bed precipitate a convulsion and with each convulsion the case gets more desperate. During the clonic part of the spasm something should be done to prevent the patient from chewing her tongue. Various things are used, the best of which is a procedure recommended by the late Dr. John Winn; a towel or napkin is rolled up and placed between the teeth, just as you put a bit in a horse's mouth. Care should be taken not to push the lips between the teeth with the cloth bit. This carries the tongue back out of the way and places something soft between the jaw teeth. When I see clothes pins, sticks or spoon handles placed between the teeth, I always have a fear of a tooth being broken off or dislodged and of its getting down the patient's throat. The patient should be kept on one side with her head low to minimize the danger of an aspiratory pneumonia. Should the patient not begin to breathe after a convulsion she should be pulled over on her face crossways the bed and artificial respiration be given by pushing down on the short ribs at the rate of eight or ten times a minute. Autopsies have been reported where the cause of death has been a solid portion of vomited food lodged in the glottis.

Among the drugs that are relied upon to control convulsions, morphin has long held first place. It enters largely into the Stroganoff, the Rotunda and the McPherson treatments. The initial dose is usually a half grain and it is repeated in one-fourth grain doses until the respiratory rate shows some effect from it. Some authors recommend that it be given until the rate gets down to eight per minute. Most authorities are content, however, to get the respiratory rate down to twelve or fourteen per minute. At the last meeting of the Eastern and Mid-Western Anesthetists, I heard Dr. Greudel talk on the dosage of morphin as an adjunct of anesthesia. He said it was foolish to have a fixed dosage for morphin. The curve of the reflex irritability varies directly with the metabolic rate of the patient and anything, as, for instance, fever, that caused an increase in metabolic rate called for a larger dose of morphin. This may be the explanation of the tremendous doses that can be safely given to eclamptics. I, myself, have given over five grains in less than eighteen hours. Chloroform used to be a popular drug to control the convulsions and it is still used by Stroganoff. In this country, however, there is a strong feeling against its use from the fact that it induces the same kind of changes in the liver that eclampsia does. One feels, therefore, that its use is adding fuel to the flame by increasing the amount of damage to the liver that is already too greatly degenerated. Chloral hydrate is a very popular sedative and figures largely in the scheme of most of the conservative modes of treatment. It has the advantage of being readily absorbed from the bowels. Theoretically, it is open to the same objection

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as chloroform, but to a lesser degree. Sodium bromide is often used along with chloral hydrate. It, too, can be given by bowel. In the past few years paraldehyde has been used intravenously at the Sloane clinic. I have no experience with its use in such a manner as I have feared that an anuria might result. I have, however, used it per rectum, alternating with chloral and sodium bromide, especially after the convulsions were under control.

Quite recently magnesium sulphate has come to the front as a sedative in the treatment of eclampsia. Dorset has used it in large doses (15 c.c. of a 25 per cent solution) intramuscularly with excellent results in some forty-eight cases. Alton and Lincoln have injected it intraspinally in doses of 1 c.c. of a 25 per cent solution for each twenty-five pounds of weight, with instant control of the convulsions. They report four personal cases and five cases from the literature. Lazard gives it intravenously in doses of 20 c.c. of a 10 per cent solution. In some cases he repeats the injection in 15 c.c. doses. His preliminary report is based on seventeen cases and three cases in which the magnesium sulphate was used in smaller doses. He recommends that a solution of calcium chloride be ready for intravenous use as an antidote, should there be any untoward effect. It is needless to say that the magnesium sulphate should be chemically pure and the solution sterile. I have no experience with the spinal injection nor the intramuscular injection, although the latter appeals to me strongly. I have, however, used the intravenous method in seventeen cases. In all of these the magnesium sulphate was the only drug used after it was began, although some of them had been given morphin and other sedatives before the magnesium sulphate was resorted to. The convulsions were stopped in every case, but in two instances a second dose of 15 c.c. had to be given. There was one maternal death in the series, that of a colored woman who was admitted to the hospital having post-partum convulsions, and with no history as to how she had been delivered. She died of sepsis on the eighth day. The remarkable thing about this treatment is the rapidity with which the mind clears up. The internes often bet among themselves on the number of minutes after an injection before the patient will wake up and ask for a drink of water. In one instance, the patient was conscious when the injection was given and she said she felt as if she were on fire all over. This feeling passed off in a few minutes. So far I have had no untoward effects, and yet I can not feel that the treatment is without danger. In spite of the feeling that I have, that the treatment is not devoid of danger, I believe it is the best remedy we have for the control of two of the danger signs, i. e., the number of convulsions and coma. I imagine there will still be times when I shall have to fall back on various drugs and such procedures as lumbar puncture and venesection in certain cases. I recall a case of post-partum eclampsia I had a number of years ago that lasted five days. Every remedy (morphin, veratrum viride, venesection and lumbar puncture) failed after a short time, and I finally was able to control the situation by keeping the blood pressure below 130 with tablets of nitroglycerine placed on the tongue.

Among the remedies to reduce the blood pressure, blood letting stands first. McPherson recommends it when the pressure is above 180 regardless of whether the case is an ante-, intra-, or post-partum one. Tweedy, on the other hand, advises against bleeding the patient before delivery, for fear of losing too much blood at delivery. At times, especially in those patients whose lungs are so filled up with edema that the brownish froth is coming out of the mouth and nostrils, the removal of 1000 c.c. of blood has seemed nothing short of life saving.

Veratrum viride has long enjoyed popularity, particularly in the South, in the treatment of convulsions. Of late, there has been a good deal written on its use in the British journals. Its action is to lower blood pressure and slow the pulse. I have had very little experience with this drug as I was brought up in a school that taught that it was too dangerous to use.

Another disputed point is the advisability of sweating. Some authorities argue that sweating relieves the kidneys of some of their burden, while others argue that it only concentrates the toxins. The eye consultants are rather prone to advise hot packs and pilocarpin where there are retinal hemorrhages and I have seen cases in which the vision markedly improved after such a treatment.

The importance of promoting the action of the kidneys is admitted by all. Water is the

best diuretic. These patients are usually unconscious and giving anything by mouth is out of the question. Water can be administered by bowels, or under the skin in the form of a 5 per cent glucose solution, or by means of a stomach tube, as recommended by Davidson. Titus gives hypertonic glucose solutions intravenously, not so much with the idea of giving fluids as for the effect of the glucose on liver regeneration, while Thalhimer thinks you detoxicate the patient more quickly if at the same time you give insulin. Matas uses a continuous intravenous injection of a 10-per cent glucose solution in cases of surgical shock, and such a procedure might be tried with advantage in eclampsia and combine the advantages of hydrotherapy with carbohydrate therapy, and, wherever the influence of the Milwaukee teaching is great, a little insulin might be given in the other arm.

There is another grave phenomenon not mentioned in the British report, and that is edema of the lungs. Whenever possible, I like to give a massive dose of digitalis as early as possible. When the patient is conscious I give it by mouth; otherwise, I give it the first time the stomach tube is introduced. I have never seen edema of the lungs occur when this is done. The effect of venesection on pulmonary edema has already been mentioned. In one of the past-partum eclampsia cases with edema of the lungs and marked cyanosis, I injected oxygen into the peritoneal cavity until there was tympany over the fundus, with happy effect. This patient was in extremis with a temperature of 105, but within a few hours the cyanosis and edema disappeared and she made an uneventful recovery.

Finally, comes the question of stomach washing, colonic irrigations and purgatives. Formerly it was my routine, immediately after the initial dose of morphin, to wash out the stomach and leave castor oil or Epsom salts and a dose of digitalis in the stomach, and then wash out the bowel with large quantities of water. I now question whether what good the stomach and colon washings do is not more than offset by the disturbance you cause the patient. The same can be said of purgation, and I have a feeling that such procedures should be postponed until the convulsions are well under control.

To summarize the treatment of eclampsia, once the convulsions have started, one's aim should be to prevent the death of the mother. This may come from the obstruction of the glottis, with immediate suffocation, edema of the lungs from heart failure in a few hours, continued convulsions and cerebral hemorrhage, or, if the patient survives these, a pneumonia that takes her off a week or ten days later. To accomplish our purpose requires constant vigilance. One should be ready to give artificial respiration should occasion demand it. The patient should be kept off her back. All noise, unnecessary light and unnecessary handling should be avoided. The convulsions should be stopped and the coma relieved as quickly as possible. The blood pressure should be lowered and kept down and the kidneys should be kept active. One's ingenuity is sometimes taxed to the utmost. The strict adherence to one plan of treatment has not sufficed in my experience. One must be ready to change the treatment as occasion demands, and in rare cases one needs all the latitude possible.

I have said nothing about delivery. This should not enter our minds until the cervix is dilated. Often the patients are cured without their going into labor. Usually, however, labor has already started or else begins during the convulsions. In such cases the labor should be conducted so as to avoid all shock. Whenever possible it should terminate spontaneously with the avoidance of anesthetics. Sometimes it is advisable to lift the head off of the perineum with low forceps when there is much delay at this stage. On one occasion I have done a version under sacral anesthesia when a shoulder presented, and once without any anesthetic when the patient stopped breathing and required artificial respiration after two consecutive convulsions. Both patients recovered, possibly in spite of my treatment.

What about the after-treatment? If the patient recovers without delivery and the toxemia persists, she should be delivered as soon as her condition warrants it. Polak strongly recommends that she be not permitted to leave the hospital undelivered. If she has been delivered and her treatment tapered off with bromides, chloral, and paraldehyde until there is no longer any danger of the convulsions returning and she has been cautiously put back upon an adequate diet, is our responsibility with that patient ended. In this connection, a recent article by Bund from Zange-

meister's clinic is of especial interest. Bund analyzed the subsequent histories of the cases of eclampsia that occurred in the Marburg clinic between the years of 1890 and 1914, consisting of seventy-six (sixty-four primiparae and twelve multiparae) women of whom seventy-two had one attack, three two attacks and one three attacks, a total of eighty-one attacks of eclampsia. Of these, fourteen died of eclampsia. Ten of the remainder were lost track of. Twenty per cent of the primiparae remained sterile as against the usual ten per cent sterility after the first confinement. Twenty per cent of those that became pregnant had eclampsia at a subsequent labor. Ten per cent of the entire series had developed chronic nephritis and 4 per cent epilepsy. Only twenty-five of the fifty-two women who could be traced were alive and well. Twelve had died of various diseases (*one* apoplexy at forty-nine years, *two* of heart trouble at twenty-one and thirty-five years, *one* heart trouble and nephritis at twenty-six years, *three* of unknown causes at twenty-five, thirty-five and forty-nine years, *two* of carcinoma at forty-four and fifty-two years, *one* of placenta praevia at twenty-eight years, *one* of tuberculosis at forty-seven years, *one* of influenza at thirty-two years). There was an immediate mortality of 30 per cent among the infants and additional 13 per cent mortality in the first week. The only cheerful thing about the report was that the children who survived the first week had as good a prospect for life and health as other children. However, one of these children died of eclampsia at her fourth confinement.

In view of this outlook for the eclamptic that survives, it is our duty to advise her that she needs careful medical supervision the rest of her life. If she shows no evidence of impairment of the kidneys, pregnancy may be permitted after three years, but she should have especially careful prenatal care.

Conclusions

The best treatment of eclampsia is the preventive one. Pre-eclamptic conditions should be relieved promptly so as to avoid subsequent kidney complications.

Eclamptics are easily shocked and should be guarded as far as possible from anything that produces shock.

The patient should be in a quiet, darkened room, and should be kept on her side. She should not be permitted to bite her tongue. Artificial respiration may be necessary.

Our first aim should be to stop the convulsions as quickly as possible, relieve the coma, and lower the blood pressure. Magnesium sulphate gives promise of being especially useful for these purposes. Morphin in full doses, chloral hydrate and sodium bromide are the most used drugs for controlling the convulsions. Venesection lowers blood pressure and relieves edema of the lungs.

Our next aim should be to supply fluids in the form of glucose solution per rectum (5 per cent), under the skin, or intravenously (10 per cent); and water by mouth if the patient is conscious, or by stomach tube if she is comatose.

The patient should be kept under the influence of sedatives for several days after the convulsions have stopped, during which time she should be fed very cautiously upon carbohydrates.

For the best results, the patient should have constant medical attention.

After the attack, the patient should be under medical supervision for at least three years, especial attention being paid to conserving kidney function.

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Medical Arts Building.

CHRONIC HYPERTENSION NEPHRITIS IN A CHILD, SHOWING UNUSUAL NEUROLOGICAL SYMPTOMS.*

By FRANK H. REDWOOD, M. D., Norfolk, Va.

In reviewing the literature on hypertension nephritis in children, one finds comparatively little in English and not a great deal in foreign journals. It is, therefore, rightly assumed that this is a rather rare disease in the young.

1. Boyd reports twenty-seven cases of nephritis, only two of which were chronic, and in none was the blood pressure high. There was blood in the urine in all cases and large amounts in some.

2. Marriott reports a case of hemorrhaghic nephritis in a boy six years of age, with a blood-pressure of 140 systolic. He believes the hypertension is due to a general capillary constriction, and the edema is due to an increase in the permeability of the capillaries rather than chloride retention.

3. Schwarz reports three cases, and classifies them as malignant hypertension nephritis. One of these cases had scarlet fever sometime before the onset of symptoms. The symptoms at the onset were vague, and all three cases complained of abdominal pain, which he thought was abdominal angina.

There were some other reports, but none in which the blood pressure was ever as high as the case reported here.

Case Report

A child of eleven years was first seen March 18, 1924, complaining of headache, pain in the eyes and nausea. Family history was negative with the exception of a very neurotic mother and a tuberculous father. She had had the usual disorders of childhood, except scarlet fever. She developed typhoid fever when five years of age. She had complained for sometime of so-called "indigestion," and the parents were told by her family physician that she had an infected gall-bladder which they were urged to have removed. This they refused to do. Her urine had shown an occasional cast from time to time. The headache dated back

*Read before the Seaboard Medical Association, at Norfolk, Va., December, 1925.

five years but had been very much worse during the six months before coming under my observation. The pain in here eyes was of two years' duration and apparently had not increased in severity.

The ophthalmologist who referred the case had found a papillitis in both eyes as well as a right ethmoiditis.

General examination showed a small child, apparently not in pain, who was well oriented and showed no mental disorders, except that she was probably somewhat mentally retarded. The reflexes were all present and equal on the two sides, and there were no abnormal reflexes of any description. The heart rate was 117, regular, and there were no murmurs. The cranial nerves were normal, except the second, which showed on the right side a papillitis of two diopters, and on the left a swelling of one diopter. The blood Wassermann was negative and the urine showed nothing abnormal. It was thought at this time that the papillitis was due to the focus in the sinus and would disappear when the infection cleared up. One week later the sinus infection had improved. There was slight headache after reading, but the fundi showed no change. Vision was 20/15 in each eye and the visual fields were normal. One month later the infected ethmoid had entirely cleared up. She had no nausea or vomiting but had an occasional headache.

The patient passed from under my observation and was not seen again until October 5, 1924. The interval history was as follows:

Her condition had gradually grown worse, and nausea and vomiting had become more severe. She vomited after taking any food in her stomach, so that she had become somewhat emaciated. The headache had become more frequent and had increased in severity. For the past five days she had been in bed.

On examination, all mental processes were sluggish and she was drowsy. There was definite facial weakness on the left side. Both sides showed some adiadokokinesia. The right optic disc showed about five diopters of choking, with about three diopters on the left. The right patella and ankle reflexes were greater than the left, the left being almost absent. There was a Babinski on both sides.

The patient was referred for further study and advice to Dr. Coleman, of Richmond, who found, in addition to the signs already given, a blood pressure of 230 systolic, 170 diastolic, and four plus blood in the urine with a heavy trace of albumin. On further investigation, the blood was found to be from the left kidney, and this kidney showed a filling defect in the upper calyx, with dilatation of the pelvis. The kidney on this side was practically functionless. Blood urea showed 10 mg. per 100 c.c. of blood, and the non-protein-nitrogen was 22 mg. per 100 c.c. of blood. The spinal fluid pressure was 40 mm. of mercury; otherwise, it showed nothing abnormal. For the next month the headache and nausea became worse, the blood pressure ranged from 150 to 260 systolic, and the eye findings suggested an increase in the intracranial pressure. On November 6, 1924, Dr. Coleman did a right subtemporal decompression. On opening the dura, he found marked pressure with herniation of the brain, but there was very little subarachnoid fluid. She was discharged from the hospital November 19, 1924, showing general improvement in the eye grounds and the headache and vomiting had disappeared.

For two months after being home she had no nausea and little headache. Then the headache returned, as did the nausea, and there was some dizziness, which gradually increased. She became weaker, and finally died in coma the early part of March. Twenty-four hours before death the blood pressure was recorded at 290 systolic. Autopsy was done eleven hours after death.

Autopsy Report

On opening the abdomen the omentum was seen to be free. Pelvic organs were normal. There was very little fluid in the peritoneal cavity. The liver was slightly enlarged and the glall-bladder considerably enlarged; the walls were thickened and showed some evidences of chronic inflammation. There were no stones in the gall-bladder.

The lungs were grayish in color at the apices and of a dark red color at the bases. The bases were not air-containing and showed areas of lobular pneumonia. The heart was probably larger than normal and there was no epicardial fat. No scars were seen on sectioning the heart muscle. The endocardium was everywhere smooth and the valves appeared competent. The aorta was quite elastic.

The spleen was smooth on its outer surface; on sectioning, the pulp was dark red in color

and firm. The corpuscles were numerous and could be readily seen. The trabeculae appeared normal.

Both kidneys were very small and contracted. The capsule stripped with some difficulty, leaving a rough surface. The architecture, on sectioning, was distorted, and the division between the cortex and medulla was made out with some difficulty. Both were considerably thinner than normal and the glomeruli were not readily seen. The pelves were not dilated, and there was no ureteral obstruction. The vessels were quite sclerotic and stood up when cut. No area from which bleeding could have taken place was demonstrated.

On removing the brain a most marked degree of arterial change was noted. Both the large and small vessels appeared like pipe stems, especially at the base of the brain. The vessels, when cut, were somewhat resistant to the knife, there being apparently little elastic tissue left. The brain as a whole was somewhat edematous, but no definite cerebral lesion was demonstrated microscopically. The cerebral meninges appeared normal.

Microscopical study of the brain, kidneys and blood vessels showed the walls of the vessels greatly thickened with nodules of elongated thickly staining cells. There was some endothelial swelling with fatty detritus and globules within the cells. All of the vessels showed widespread thickening.

Comment

The patient presented signs of marked intra-cranial tension. After the hypertension was found and the investigation of the urinary tract had been done, it was thought by the investigators that the cerebral condition was due to hypertension. Decompression was done as a palliative measure for relief of headache, which it did accomplish for a short time. This case seemed to show the highest blood pressure reading ever recorded in a patient so young.

503-7 *Medical Arts Building.*

Life is very simple. Men don't pass you by
Just because you're wearing last year's coat or tie;
Friendship here is builded not on whims like that,
Men will not dislike you, being thin or fat.
So, if you're not winning all that seems your due,
Something is the matter, possibly with you.

—Guest.

SOME THOUGHTS ON DIPHTHERIA.*

By J. A. WRIGHT, M. D., Doswell, Va.

Diphtheria is an acute infectious, contagious, disease due to the Klebs-Loeffler bacillus and characterized by the formation of a fibrinous exudate or pseudomembrane at the point of infection, and by systemic symptoms which are due to the diffusion of the toxins formed.

Age: Diphtheria is very rare during the first year of life. It is also uncommon in adults, although no age is exempt. The most susceptible age is from two to ten.

Predisposition: Vigor of constitution does not seem to have any influence on susceptibility, the strong and healthy and the weak and delicate alike contracting the disease; weak throats, however, as those with diseased tonsils and adenoids do seem to predispose.

Transmission: Diphtheria is transmissible both directly from the patient and indirectly through persons or things used about the case. The indirect transmission, however, is probably rare. It is also spread by what are termed diphtheria carriers who are persons not sick but having the germs of the disease in discharges from the nose or throat.

Pathology: The germ of this disease was discovered by Klebs in 1883 and isolated and cultivatd by Loeffler in 1884. The favorite sites for its lodgment are the mucous membrane of the throat, larynx and nose. Exceptionally, it may be seen on the skin ,in the ear, vulva, conjunctiva, and other places. The bacilli remain localized at the seat of infection, but the toxins formed invade the blood and are responsible for the general symptoms. The bacillus may persist in the throat for weeks after an attack.

Incubation: This is variable, from two to five days being the average. One exposed may be considered safe after nine days have elapsed without development of symptoms.

Symptoms: These may come on very acutely or develop slowly. Many children are not seen for several days by the physician on account of mild and slowly developing symptoms. The symptoms and physical signs consist of the membrane, sometimes swelling of the lymph glands at the angle of the jaw, sore throat, painful deglutition, fever and the general symptoms due to the toxins of the disease.

Diagnosis: There is only one way to tell

*Read before the Hanover County (Va.) Medical Society.

diphtheria and that is by bacteriological examination. It is to be differentiated from tonsillitis and from the sore throat of scarlet fever.

TREATMENT: There is only one treatment for diphtheria. That is antitoxin. It is all important that it be given early. The constitutional symptoms due to the diffusion into the system are what kill. In diphtheria the system is poisoned by these toxins and the antidote is antitoxin. I feel sure that every case of sore throat showing any membrane should immediately be given a dose of antitoxin. We should not wait. We should always take a swab and have it examined later. If it were diphtheria we have gotten in on the ground floor. If it were not we have done no harm, only a little discomfort and a slight financial loss. These cannot be weighed against probable loss of life or damaged heart, or diphtheritic paralysis. I think we might except the case of a tonsil with numerous pin point exudates, but if there is any membrane of any size, we are not doing ourselves or the patient justice if we wait at all. Every physician practicing in the rural districts should always carry with him at least one dose of antitoxin, and on seeing for the first time any case that is the least suspicious he should give this at once, take a swab, but never wait to give the antitoxin until he hears from the laboratory.

As to the site for inoculation, I don't think it matters much. Some prefer the abdomen, some the back below the scapula, some the thigh. As a rule, I have used the buttock. Of course, strict antisepsis must be practiced with the injection.

There is some little danger of anaphylaxis in the use of diphtheria antitoxin as there is in the use of all horse serums, and some recommend a minute injection and waiting fifteen to thirty minutes before the real injection. This is probably a more or less wise precaution, but I personally have never seen a case of anaphylaxis in the use of any of the serums nor have I ever used the precautions mentioned.

Now as to the dosage: I am firmly convinced, and I think the majority of us who are giving diphtheria antitoxin regularly are, that the initial dose should practically never be less than 10,000 units. We gave much less in the past and I can remember when I never gave over 3,000 units. The initial dose is, as a rule, the most important. Many times it is the only dose necessary. I say do not temporize. Do not be afraid. I have never known it to hurt. Then why not give enough to do the necessary work? If you were putting out a blaze with a bucket of water you would not use the dipper. Let us use the serum method with this dread disease; 5,000 units may do the work, 10,000 is much more apt to do it. Ten thousand the first day is worth more than 20,000 the second day or the third day. So let us fight with the only real weapon, and let us get in our work on the first visit and make the dose sufficient to be reasonably certain.

As to subsequent doses, we have to govern ourselves by the effect of the first dose and the symptoms. If there is no noticeable effect from the first dose after twelve hours, or certainly eighteen, we should repeat it or give more. It is best to give it every day for several days rather than to wait if the case is not improving. In grave laryngeal cases and where seen late, 20,000 to 30,000 units are often given to advantage. I confess that I have not often given these large doses. I believe, however, if 10,000 units are given on the first day, those subsequent large doses are seldom necessary. I have had no experience with intravenous use of antitoxin. It should be easy to give but I have never found it necessary.

PROPHYLAXIS: This is one of the most important parts of our subject. I will not speak of quarantine. We all understand the necessity of this. All children who come in contact with diphtheria should be immediately immunized with an injection of 1,000 units of the antitoxin. This will probably save them from contracting diphtheria from that contact. This immunity lasts probably three or four weeks and is not always perfectly sure. If they contract the disease, they usually have it in a milder form.

What I wish to speak of mainly in the way of prophylaxis is the use of toxin-antitoxin. This mixture of toxin and antitoxin in quantities sufficient to equalize one another has been found to render persons immune from diphtheria for a long period of time. We do not know as yet how long the effect holds good, many claiming it to be for life, while the majority feel it will be safe for a number of years.

We have, however, a simple test called the Schick test which, taken from time to time, will prove whether the toxin-antitoxin is still giving immunity and, if not, we can inject more.

It is not necessary to go into the technique of all this. Toxin-antitoxin is given in three doses, five to seven days apart, and immunity is not developed for one to six months.

The Schick test is very simple and can be done by any doctor anywhere, care being taken not to mistake the pseudo-positive for the positive reaction.

Of course when there has been a recent exposure to diphtheria, antitoxin should be given, but if toxin-antitoxin could be given to children not exposed and the Schick test applied at intervals and we could really get all or a majority of children inoculated, we would be doing a wonderful thing for our constituents and our community.

This is an opportunity not to be overlooked and I really think that in some way it should be brought before the public in some convincing manner so that we might save the little ones from this dread disease.

PRESENT METHOD OF DEALING WITH KIDNEY AND URETERAL STONE.*

By SEAVY HIGHSMITH, M. D., Fayetteville, N. C.

I have been induced to write this short paper on the management of stone in the kidney and ureter from the fact that I frequently have patients come to see me who have suffered from renal colic or been told that they had stones in the ureters who would want to have the stone removed and return home the same day. The impression seems to have gone out that one skilled in cystoscopic work can remove a stone at one sitting and let the patient get up and go along as though nothing had happened. As a matter of fact, most of the migratory stones of the ureters and a great many of the stationary or "silent" stones can be removed or caused to pass by skillful and persistent use of the cystoscope with proper bougies, dilators, and extractors. There are certain types of the "silent" or stationary stones that are practically impossible to remove from the ureter in this way, and a dangerous delay results if we depend all together upon this method.

*Read before the Cumberland County, N. C., Medical Society, October 16, 1925.

SUMMARY AND CLASSIFICATION BY BUERGER

Stones may be found in any part of the upper urinary tract, but they are more common in the kidney than in the ureter.

Renal Colic: (Migration of the Stone).—Renal colic occurs in 50 per cent of all cases of nephrolithiasis. These attacks are characterized by agonizing pains which appear suddenly in the loins. Pains radiate to the testicle and inner side of the thigh. In aggravated cases the pains may radiate throughout the entire abdomen and chest and be most severe in the back.

Sudden total anuria may be the first symptom of stone in the kidney or in the ureter. Strangury and frequent micturition are commonly observed. The urine is scanty, high colored, and has a high specific gravity.

Collapse symptoms are prominent: Cold sweat and feeble pulse. Nausea and vomiting common. During the attack meteorism may be conspicuous. Rigors may precede an attack. The temperature may be elevated up to 103.

After the attack the patient passes urine frequently and blood may be detected in the specimen. If there is a suppression of urine, uremia may follow. Following the acute attack and persisting for a few days the patient complains of more or less persistent pain in the back on the affected side.

It is difficult to palpate the kidney during an attack owing to tenderness and muscular spasm. The sudden cessation of pain signifies the return of the stone to the pelvis or its successful passage downward into the bladder.

Stationary or "Silent Stone".—a. Pain in the back. More often a soreness than an actual pain. May become severe and paroxysmal-like. While pain is usually referred to the affected side, it sometimes happens that the patient will complain of pain on the opposite side. Pains may radiate as in a typical attack of renal colic.

b. Hematuria. While bleeding is not profuse, it becomes more severe by excessive motion, and mitigated by rest. The greatest bleeding occurs with oxalic acid stones. Worm-like clots which commonly form in the ureter in these cases may be discovered in the urine. A trace of albumin plus a microscopic evidence of blood in the urine may be the only urinary findings which lead us to suspicion

stone. Oftentimes the first symptoms of stone are profuse hematuria associated either with or without pain.

c. The kidney enlarges in about 33 per cent of the cases. When hydronephrosis complicates stone, then the enlargement is very pronounced.

d. Day frequency of urination very common. Pain at the tip of this penis after voiding. Renal sand may be passed for years, as also fragments of stones. Uric acid calculi most common.

e. Danger of infection: Pyelonephritis, pyelonephrosis and, lastly, the liability to the development of hydronephrosis are to be remembered.

f. Gastro-intestinal symptoms: Vomiting and epigastric tenderness are common.

Cystoscopy is important not only for diagnosis but for treatment. In uncomplicated cases of calculus of the upper urinary tract, the bladder is normal excepting a slight hyperemia around the ureteral orifice, from which one may or may not observe a jet of bloody urine.

Ureteral catheterization is very useful to demonstrate location of stone. Examination of the catheterized specimen may show blood and crystals.

Stone in the lower part of the ureter may sometimes be palpated through the rectum. A stone in the ureter near the bladder may show a pouting or swelling of the mouth of the ureter, and the urine flows out irregularly from the obstructed ureter.

Stone high up in the ureter causes pain in the lumbar and subcostal region, and these pains radiate towards the groin, into the penis and the testicle. If the stone migrates downward, the pains will radiate towards the abdomen, groin and testicle. When the stone reaches the lower portion of the ureter, we will observe, in addition to the pain, vesical tenesmus and urinary frequency (the latter being conspicuous in renal colic).

Renal colic plus anuria invariably denotes occlusion of the ureter by a stone.

A wax-tipped catheter introduced in the ureter may be withdrawn showing scratch marks where the tip engaged the stone in the ureter.

Functional Test.—In non-infective cases no difference is observed in the two kidneys. In infected lithiasis a diminution of functional activity occurs together with evidence of pyelonephritis.

Roentgenography.—In almost all cases absolutely diagnostic shadows can be obtained by using the proper technic. Fifteen or twenty per cent of stones will not give a shadow to X-ray unless a radiogram is made. It might then be sometimes difficult to determine from the negative.

As to stones in the kidney, unless they can be induced to come down into the ureter by some manipulation or dilatation of the pelvis of the kidney, it is, of course, useless to attempt to remove them with the cystoscope.

The manner in which the stones are removed is by dilating the ureter sufficiently to allow the stone to pass down into the bladder. This is passed down by using, first, a small bougie or catheter, passing it to the site of the stone, gently manipulating it until it has passed by the stone in the direction of the kidney pelvis. In doing this you have dilated the ureter in proportion to the size of the catheter passed. The second bougie or catheter may be passed to the site of the stone and beyond. If possible to pass two catheters by the stone, the situation is, as a rule, well in hand because this insures dilatation of the ureter. If the catheters are allowed to remain in this position for several hours, the stones will so embed themselves into the catheter it will be withdrawn when they are drawn down the ureter. This is done very much in the same way that the cork was drawn from a flask in pre-Volstead days by passing a knife blade on either side of the cork, taking the two knife handles in hand and making a pull.

I think the method of injecting sweet oil through the lumen of the catheter behind or above the stone is very helpful in causing it to come down as the oil is not only lubricating, but of a higher viscosity than the urine. It causes more pressure from above. If, when the catheters are withdrawn, the stone does not come down into the bladder, another twenty-four or thirty-six hours or even a few days may be allowed before another attempt is made, as the stone may pass in the meantime. In case it does not, one attempt after another may be followed up. Sometimes it is necessary to carry your patient over a period of several weeks before he is rid of the stone. The ureteral orifice may have to be enlarged by slitting with a pair of shears before the

stone can pass or sometimes even before a catheter can be inserted into the ureter. If the stone has come down to the ureteral orifice, it can easily be removed by this slitting operation and the application of the stone forceps to drag it into the bladder.

One can readily imagine that the urologist can not promise his patients to deliver the stone to him at one sitting; neither can he tell him just how long it will take by faithful co-operation. He can, however, insure success in almost every case in which the catheter can be passed beyond the site of the stone in the direction of the pelvis of the kidney. By persistent efforts the dilatation can be completed and the stone induced to come down. The point I wish to make in this paper is that, stones in the ureter of long standing and embedded by inflammation, induration, and scar-forming tissue, with a resulting stricture-like condition to such an extent that, by skillful and diligent effort, a sound or catheter cannot be passed beyond the point of blockage. I would advise the open operation upon failure at the first attempt.

I am using only two cases to illustrate:

1. The first case is that of a trained nurse, age twenty-four, who had always been well and strong until day of graduation. On her first private case she was taken quite ill with kidney colic, and was brought to the hospital. Temperature on entering was 100, pulse 120. She had pain in the right side; leukocyte count was 17,400. She was toxic; urine showed albumin, blood and pus. X-ray picture showed a stone the size of an almond in her right kidney. As soon as the patient's condition permitted, kidney was opened and stone removed. Patient slowly recovered from the operation until only a sinus was left leading to the kidney. This would sometimes heal and then again break loose with an escape of pus and urine. Repeated X-rays were taken, but no stone was shown in the ureter in the right side. Cystoscopy was done. A catheter could be passed to a point about three inches below the kidney pelvis. Obstruction was met, but catheter could not be gotten by. As no stone was revealed in X-ray, it was thought that the obstruction was due to a kink or stricture. The patient kept coming back to the hospital with recurring attacks of opening and closure of the sinus at point of old operation. At last it was found that she had a stone in the left kidney. This was removed by open operation, the wound healing promptly. Still the right side never returned to normal. I advised an operation on the right ureter at the point of obstruction, having in mind an embedded stone even though X-ray did not reveal it. The operation showed a stone the size of a large peanut so embedded it was impossible for the stone to move out of its bed or for a catheter to pass beyond it. The patient then made a good recovery. The old sinus from the right kidney promptly healed. As soon as the wound was sufficiently healed, the catheter was passed to the kidney and the point of old blockage was free. The patient returned to her profession and has worked steadily since.

2. Mr. J. W. W., consulted me September 26, 1925, for repeated attacks of renal colic which he had had for a period of over six weeks. He came to get the stone removed and to return home that afternoon. I advised him that I would not do any cystoscopic examination on him that day as he had to return. On examining him I found that he had a very small urinary meatus that would not at all admit a cystoscope. So, a meatotomy was done and an X-ray picture taken, which revealed a stone in the right kidney. The patient then returned to his home. On the following Tuesday, September 29th, he returned, having had three severe attacks in the meantime. On this date a cystoscope was passed in the bladder without difficulty. Bladder was normal. Right ureter congested and pouting. No. 6 catheter was passed to the kidney, passing the obstruction with much difficulty. Obstruction was met three inches below lower pole of left kidney. A second bougie No. 6 was passed up to the point of obstruction, but I was not able to get it by. Specimen of urine from the left kidney contained blood cells, debris, no pus. Patient was put to bed with catheter in place until the following day. As the urine passed freely, the catheter was removed in the meantime. He did not have any kidney colic and passed a good night. On the second day, September 30th, these catheters were removed and a No. 8 bismuth catheter inserted toward kidney, passing the stone with little difficulty. This catheter was again left in place. X-ray showed the catheter had passed the stone on the level with the 9th and 10 ribs. Catheter was left in place for three hours, after which two drams of sterile sweet

XUM

oil was inserted through the catheter above the stone, and the catheter removed. Patient still had no colic or discomfort. Considerable traction was made on the stone when the catheter was removed. The stone was passed by the patient on the second day after returning home.

Cumberland General Hospital.

ACUTE MASTOIDITIS IN INFANTS—REPORT OF THREE CASES.*

By G. B. DUDLEY, M. D., Martinsville, Va.

I want to report three cases of acute mastoiditis in infants. One is unuusually young, being only fifty-six days old, another four months of age, and the third ten months of age. These three cases came under my care within thirty days, and two of them presented many identical features and symptoms, while the third varied somewhat.

Before giving the history of these cases, I wish briefly to review the anatomy of the mastoid in an infant, and also the precautionary measures one must pursue in operating upon them.

The temporal bone ossifies from eight centers. At the end of the fifth month, these have coalesced, but even at birth the bone readily separates into three parts—the squamous, and petrous portions, and the annulus tympanicus or processus auditorius. His annulus tympanicus represents the osseous canal of the adult, and by gradual development forms the bony external auditory canal. The ossicles, tympanum, and mastoid antrum of young children are nearly as large as those of an adult, but situated superficially. In young infants the mastoid antrum is situated immediately above the posterior tubercle of the annulus. It should also be remembered that the squamous-mastoid suture is not ossified at birth, and frequently presents large opening during childhood, so that, in making the initial incision for a mastoid operation upon a very young child, the point of the knife should not have too much pressure upon it or it may enter one of the openings and penetrate the cranial cavity.

It must also be remembered that at birth the facial nerve emerges not on the inferior surface, but on the external (lateral) surface of the temporal bone at a point close to the annulus and somewhat above its inferior border.

*Read before the Patrick Henry Medical Society, at Martinsville, Va., March 4, 1926.

At birth the mastoid process consists of a small flattened tuberosity containing but one cell, the mastoid antrum. At about eight years of age, the mastoid generally contains numerous other pneumatic spaces radiating from the antrum. At puberty the mastoid has become a distinct prominence, conical in shape, with its apex downward.

Case 24. Female infant, fifty-six days of age, referred to me by the family physician with the following history gotten from the mother:

Right ear had been discharging about one month; about eight days ago, a swelling began behind the ear. The child seemed to suffer very little, and had slept fairly well. This enlargement had gradually increased in size.

On examination I found the external auditory canal filled with thick, tenacious pus and a regular 'text-book picture" of mastoiditis in an infant, with the auricle pushed away from the side of the head and the region over the mastoid antrum very red and edematous. The child apparently had no fever. Immediate operation was advised, which I did that afternoon.

On making the incision through the periosteum, under ether anesthesia, I found the pus had already perforated the cortex, and little was left for me to do except to thoroughly clean out the mastoid antrum. An iodoform drain was left in for one week; in about two weeks the wound was healed nicely, and the ear had ceased discharging.

Case 25. Female child, ten months of age, well nourished, was brought to me by the parents with the following history:

A swelling came behind the left ear about one month previously. The family physician gave them a salve which caused the swelling to practically leave, but it soon returned and the child cried and picked at her ear. The salve this time seemed to do no good.

On examination I found the ear drum intact and normal in appearance, with no discharge, but another "text-book picture" of mastoiditis in a child, with the auricle pushed away from the side of the head, and the region over the mastoid antrum very edematous and inflamed. This child also had no fever.

Immediate operation was advised, which I did that afternoon. In this case, too, I found pus had already perforated the cortex, and, although more bone had to be curetted than

in the previously mentioned case, still there was not much "operating" to be done. I did a myringotomy, but practically no pus drained through the external auditory canal. Drainage was left out of the wound on the sixth day, and the child was discharged on the ninth day with the wound practically healed.

Case 26. Female child, four months of age, referred to me by the family physician, with the following history:

Child cried the previous night, and did not rest well. An enlargement was noticed behind the right ear, and the family physician called, who subsequently called me.

On examination I found an enlargement over the right mastoid antrum. This was very hard and seemed rather far back for the antrum. The ear drum was intact and normal in appearance. The child had a slight elevation of temperature.

A mastoid operation was decided upon, which I did that day at noon. The mastoid in this child was highly developed for a child her age, and the bone very sclerotic and dense. I had to use chisels, curettes, and rongeurs as if operating upon an adult. Little pus was found, but several days subsequently the wound drained rather freely and persisted for some days. A myringotomy was done, but no pus drained from the middle ear. This child made an uneventful recovery, but has more scar than the other two cases.

This case differed from the other two in that it was gotten very early, before much pus had collected in the mastoid.

Burch Building.

DIABETES.*

By A. T. FINCH, B. S., M. D., Chase City, Va.
Chase City Hospital.

In 1921 F. G. Banting and Charles H. Best announced the discovery of a ferment by isolation of the internal secretion of the pancreas. They had entered a field and made a real discovery where others had entered and failed. By 1922 they were able to demonstrate by animal experimentation that they had discovered an extract capable of combating diabetes mellitus. Early in 1922 this remedy was tried and found to be of great value as a remedy in diabetes of the human race. It was found after administering this remedy that patients were once again enabled to utilize carbohydrates in a normal manner. In May, 1922, the new ferment was made on a large scale and placed on the market as Insulin. It was made from the internal secretion of the islands of Langerhans. The supply was limited at first and it was distributed to a number of internists who used it as a remedy for diabetes. It was thoroughly tried out and found to be a remedy of known value. Insulin has passed the experimental stage and, while it is not a cure for all cases of diabetes, along with a properly restricted diet, it will cure many of the early or mild cases, and in those cases which it does not perfect a cure it does enable the diabetic to carry on, and enjoy a happy useful life as long as a proper diet and a proper diabetic regime, are maintained.

Insulin is now manufactured by several chemists, and is marketed by Lilly as Iletin, by Squibb as Insulin, and by others. Its price has been steadily reduced. It is now on the market in three forms or three strengths, and in using it one should always know the exact strength by units. It is standardized on rabbits. A unit of Insulin may be said to be one-third of the amount required when injected under the skin to reduce the average blood sugar over a period of five hours to 0.045 per cent in a normal rabbit, which is about two kilograms of body weight. It is made in five, ten and twenty units to each cubic centimeter of solution. Clinically, it is found that one unit of Insulin enables diabetics to metabolize an average of fifteen to thirty grains of glucose. This rule may vary in different patients. Insulin is administered subcutaneously, and is best given half an hour to an hour before meals. It should be injected under the skin, not into the skin, nor deep into the muscles. The site of the injection should be wiped clean with a proper antiseptic solution, as in giving any hypodermic. The skin areas used are the outer side of the thigh, the upper middle arm, the buttocks, and the abdomen. It may be found advisable to permit the patient to choose the least painful part, and it is well to use different parts, and not to use just one spot all the time.

Metabolic Relations in Diabetes

That one may have a clear conception of diabetes it is well to have some idea of what occurs in the normal individual. The average adult diet needed to furnish the body with

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the necessary heat and energy consists of three hundred to four hundred grams of carbohydrates (starches), one hundred grams of proteids (meats), and one hundred grams of fats. The carbohydrates are absorbed in the blood stream as glucose (a kind of sugar), and this furnishes a readily combustible fuel which, if not required by the body, is stored in the liver and muscles as glycogen. The protein is broken up into amino acids and is absorbed as such. Fifty-eight per cent of the protein ingested is available and may be utilized as carbohydrates. The remainder may be used to replace tissue waste due to the daily wear and tear of the body. The fats are digested as fatty acids and glycerine. The glycerine content of the fat may be used as glucose up to 10 per cent. In order that fat may be used by the body there must be coincident combustion of carbohydrates. The amount of glucose necessary to burn fat is about one part of glucose to three parts of fat. In normal persons, after taking food, the blood sugar rises. Glycosuria is not produced, however, because the normal pancreas secretes sufficient Insulin to maintain blood sugar at a normal level. Should the pancreas be diseased and too little Insulin be secreted, we will have glycosuria or the onset of diabetes. The treatment of diabetes aims at supplying the patient with the right amount of Insulin. This is done in two distinct ways,—first, by changing his diet so as to diminish his intake of carbohydrates; second, by putting Insulin into his blood. If, after cutting off the carbohydrates, his secretion of natural Insulin is not enough to balance his blood sugar, then, by testing the blood and urine, we estimate the dose of Insulin needed, and, by careful watching these two and cautiously increasing our Insulin, we soon find the amount to give on a certain diet and on doing a certain amount of work. By giving the pancreas less work, as by furnishing the Insulin, we enable the pancreas to recuperate, and in quite a number of cases, if begun early before the internal cells of the pancreas are destroyed, we may entirely relieve this class of cases.

Body Requirement of Food

Vital processes and body action require certain amounts of fuel. These must come from ingested food or from the tissues of the body itself. The resting adult requires twenty-five calories per kilogram (2.2 lbs.) of his body weight in order that his own tissue reserve may not be drawn upon. Exercise and work increase his food requirement, so we must consider the work, the weight and the general requirement of the body, in making a diet for the patient. Growing children often require as much as seventy calories for use per kilogram of body weight and of proteins alone as much as three grams per kilogram of weight.

Diet in Relation to Diabetes

Primarily, all cases of diabetes are dietetic and in quite a number of cases the disease can be cured by diet alone. In many cases it is best to starve the body for twenty-four hours and then place the patient on a restricted diet, seeking by a low caloric diet to restore the diseased pancreas to a state of rest so it may cure itself. Or, it some times become necessary to give a diet high in fats, depending on the fact that combustion of a given amount of glucose will enable the combustion of a calculable amount of fat. If by restricting the diet and resting the patient we cannot remove the sugar, we must then give the body some Insulin. The administering of Insulin may be once, twice, or three times daily, preferably half an hour before a meal. Many times a single morning dose is sufficient, and this is to be increased daily until sugar is removed from the blood and urine. Each day we administer Insulin we must make a test for sugar in the urine. We should have the daily out-put collected and tested every morning; if we find sugar, then we can give our dose of Insulin. We should make a quantitative analysis of the urine so we may calculate the amount of Insulin to use. When a fairly constant excretion is obtained, the dose of Insulin is then calculated. One unit of Insulin will cause the disappearance of 1.5 grams or twenty-three grains of sugar from the urine. For example, if the patient's daily out-put of sugar is 230 grains per day, ten units of Insulin should cause it to disappear from the urine; if it does not, we should use a small increase, very small and very cautiously. Now, having rendered the patient sugar-free, we permit an increase of the diet, allowing a more liberal use of the carbohydrates, and watch patient. The patient should be finally put upon a dose of Insulin that is just sufficient to prevent glycosuria and to maintain a normal blood sugar

level. Blood sugar estimation and determination are most helpful, but are not as essential if the urine is tested daily and watched for sugar. When a diabetic receives too big a dose of Insulin, the blood sugar falls below 0.1 per cent per 100 and we have hypoglycemia (low blood sugar) to deal with, and then we have a train of serious symptoms to begin. Untreated hypoglycemia is dangerous, and is the one danger associated with Insulin. Careful and intelligent supervision by the physician and intelligent co-operation by the patient will avoid this trouble. But, should we have a case of hypoglycemia, we give sugar, orange juice or candy. The early symptoms of an over-dose of Insulin are:

1. An unaccountable restlessness and sensation of impending trouble, associated with a feeling of tremor in the limbs, especially the legs.

2. Marked hunger, with weakness and fatigue.

3. Perspiration, which is often profuse, and pallor, dilated pupils, sometimes a flushing of the face, and increase of the pulse rate to 110 or 120. If these warning symptoms are disregarded and more Insulin given, or some steps are not taken to counteract or relieve the symptoms above, further serious symptoms will develop, as disturbed vision, dizziness, aphasia, loss of memory, emotional excitement and delirium. These will be followed by marked lowering of blood pressure and collapse, unconsciousness and, finally, death.

Hypoglycemia usually follows the use of too much Insulin,—too large a single dose or too many smaller doses—increased activity of the patient's pancreas (getting well) after the long use of Insulin, the injection of Insulin too long before meals, decreased food absorption as when a meal is missed, and when the patient develops severe diarrhea; also by unusual exercise which increases the metabolism of carbohydrates by the patient.

In the treatment of hypoglycemia, the symptoms, if noticed promptly, are quickly relieved by taking glucose (sugar, orange juice, candy, syrup or other sweets); corn syrup in tablespoonful doses every fifteen minutes quickly relieves. If collapse has occurred, corn syrup may be diluted and given by the stomach tube. Ten to thirty grams of sterile glucose may be given in a 10 to 50 per cent sterile solution intravenously.

Hypoglycemia with coma must be closely watched and guarded against by frequent blood sugar and urinary sugar estimations, preferably the blood sugar test.

Owing to the impairment of metabolism in diabetes, acidosis is frequent, indicated by acetone bodies, diacetic acid appearing in the urine. Diabetic acidosis should be differentiated from acidosis due to complicating conditions, such as diarrhea, prolonged vomiting, head injuries, starvation or apoplexy. A diabetic patient may be subject to simple ketosis or coma depending on the amount of glucose that is being metabolized in the tissues of the body. Simple ketosis is indicated by the presence of acetone bodies in the urine, and is readily overcome by proper dietetic supervision. When defective metabolism is more pronounced, symptoms of air hunger, drowsiness, fatigue, restlessness, soreness of muscles of the abdomen, and nausea are complained of. If acetone bodies are in the urine, we have a condition of acidosis, and there may be a distinct odor of acetone on the breath. Blood analysis should be done to determine the amount of blood sugar and Insulin should be given promptly and boldly in order to prevent diabetic coma. Ten to twenty units should be given every two or three hours depending on the clinical symptoms and the urinary and blood findings. During this time of giving large doses frequently, and in serious cases, it is wise to give by mouth one gram of glucose for each unit of Insulin. If necessary, a retention catheter should be placed in the urethra and kept there so a specimen of urine can be obtained every hour to check up on test. The treatment of acidosis should include rest, warmth to the extremities, and five or six ounces of warm fluid should be given every hour. The large bowels should be thoroughly emptied and a 5 per cent solution of soda may be given by bowel continuously. The diet should be so adjusted that a minimum of ketone producing bodies are taken in the food. The bicarbonate of soda may be given by the mouth in two and three drachm doses until five doses are given, and Insulin is given every six hours in moderate doses. The diet should consist chiefly of carbohydrates until the urine test shows a marked decrease in the acetone bodies. In the acetone cases one has to be very cautious in the diet; we must increase the proteid diet first, then the fat can be increased,

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and, on the subsidence of the acetone bodies in urine, the diet and Insulin may be regulated until the urine is sugar free.

When a diabetic patient is continuously drowsy and delirious and has an odor of acetone on the breath (sweetish odor), diabetic coma is threatening or present. This condition can be combated effectively by using large doses of Insulin, intravenously, and at the same time you must give one gram (15 grains) of glucose per unit of Insulin, administered either by mouth, rectum or intravenously. This must be done to prevent hypoglycemia. As absorption from the stomach and bowels is not dependable in these coma cases, it is best to give this antidote, glucose, in a 5 to 50 per cent solution (sterile) intravenously. Injection should be made not faster than ten c.c. per minute of the glucose solution. If there is any rise in the pulse, discontinue temporarily. A catheter should be kept in the urethra so that the urine may be tested often. I have found that twenty units of Insulin and twenty grams of glucose can be given every four hours for three or four doses. Discontinue this as the patient improves, except that the Insulin should be continued two or three times a day. The initial dose of Insulin for coma cases should be given as soon as the diagnosis is made. If intravenous administration is impossible, give fifty units subcutaneously and administer the glucose by stomach tube. Glucose is now put up in ampules for intravenous use. In cases of diabetic coma, speed is a safe plan,—the first hour of treatment is most vital.

In cases of gangrene, acute appendicitis, goiter, cataract, etc., surgical treatment may be applied to diabetic cases with comparative safety and little added risk when Insulin is used.

A diabetic patient should be *taught* the character of his disease, also that most of the cases can be relieved. It is advisable, however, to have the patient for a while in a hospital where instructions as to proper diet may be given, and where he may learn the tests that are to be made. A patient should be taught a simple test for sugar in the urine, likewise how to administer Insulin hypodermically, and how to manage and weigh his diet. This is very important. With a knowledge of his condition, he may, by making the tests himself, regulating his diet and administering his Insulin, soon learn how to care for himself intelligently. He should be directed to report to his physician once a month for a check up. We have found this to be the best way to handle these cases.

In handling a good number of patients, we have found the following "*Dont's*" are good:

Don't break diet, you are the one who suffers.

Don't over-work or over-play; worry and fatigue are borne badly by diabetics.

Don't neglect the bowels or the skin; regular movements and a clean skin will do much to prevent boils and gangrene.

Don't forget to test daily the urine for sugar and diacetic acid.

Don't experiment with new foods; if in doubt, consult your physician.

Don't grow fat; keep ten pounds underweight.

Don't try what Mr. Brown or Mrs. Smith use for diabetes; you are neither of these; your case may present many variations. Consult your physician; he studied your case as well as your body.

Don't grow careless; it is the careful invalid that lives the longest and happiest.

Don't forget that there are two strengths of Insulin; verify the strength on the label.

Don't alter your diet or your dose of Insulin unless directed by your physician.

Don't wait for symptoms of hypoglycemia to become serious, but take glucose. Glycosuria is safer than hypoglycemia.

Don't delay a meal after taking Insulin. If you are vomiting much, omit the Insulin.

Don't forget sterilization of the syringe, needle and the skin, and the rubber stopper of the Insulin bottle before giving yourself a dose in the arm.

Don't forget to consult your physician at any time if in doubt,—safety first, last and always.

We have had at the Chase City Hospital quite a number of cases of diabetes, and have cured a number. All that we have been able to teach our plan of procedure have been relieved. I will take a few of the cases from the file, the first two being of the mild type.

Mrs. E., entered the hospital June, 1924, and remained ten days. Blood sugar was .34; examination of the urine showed a specific gravity of 1,030, with 2 per cent of sugar. The patient was starved one day, and then put

on restricted diet. She was given two doses of Insulin, each 5 mils. of a 20 unit strength. Her urine and blood cleared immediately and she was taught the tests and how to pick her diet. She left the hospital in ten days entirely recovered and sugar free, and has not found it necessary to take Insulin since. She was given a liberal carbohydrate diet, and we have tested her urine every month for the past year and she has been free from sugar.

Another case was that of a child brought in for tonsillectomy. Urine was found full of sugar. The parents were advised to keep the child with us so we might first remove the sugar and give the child a chance to get well. This advice was refused and they took the child home; in two weeks it died. This case is mentioned to show that sometimes one may have diabetes and not be aware of it; also to show that if I had operated for removal of the tonsils (which were large enough to meet in the throat), the child would prabably have died and tonsillectomy would have been blamed. I also believe this child was neglected in not having treatment instituted for a disease that in many cases can be cured.

Case No. 1223 was Mr. W., whose urine showed a specific gravity of 1,040, with 8 per cent sugar. Blood sugar 146. This case was starved for twenty-four hours and placed on restricted diet. He was given 1 c.c. 20 unit strength of Insulin night and morning for two days, after which this was increased slightly. The urine was kept sugar free. Insulin 1 c.c. once daily was continued, together with a restricted carbohydrate diet. This patient was an old man and his daughter was taught to make the test for sugar and to give the Insulin. He did well as long as he kept up his diet, but whenever he would break away from this, he would have to increase the dose of Insulin or suffer. He finally got so that 1 c.c. of 20 units Insulin given three times a week would hold him sugar free. He has been seen every month by his physician, and is doing well, but has to take some Insulin occasionally.

Mr. G., weight 200 pounds. Sugar present, 120 grains being found in twenty-four hours. A few ten unit doses of Insulin and a carbohydrate free diet reduced all sugar. Insulin was then withdrawn and moderate restricted diet given. Patient shows no sugar as long as he adheres to his diet, but when he breaks it, we find a small amount. Patient has only used diet for one year.

Mr. W., had diabetic coma, preceded by drowsiness. Sugar was very high. Insulin was given every four hours (twenty units) and watched. This patient recovered. His sister was taught to make the sugar test and give Insulin. He has been under observation for three years, and never has been sugar free except while in the hospital, but he has been able to work and make a crop for the past three years, under a restricted diet and with the use of 20 units of Insulin before dinner and 10 units before supper.

Mrs. E., showed urinary sugar—8.33 per cent. Relieved by Insulin and diet. She reports once a month, and every time she breaks from diet or omits a dose of Insulin, 10 units daily, she finds sugar. She is able to work.

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Chase City Hospital.

BONE INFECTIONS.

By ALONZO MYERS, M. D., F. A. C. S., Charlotte, N. C.

The results of pyogenic infection of a bone are:

1. New bone production, usually with increased density and thickening. This is a reparative, reconstructive process. It requires no treatment, except in efforts to preserve bone length and, sometimes, to correct deformity.

2. Periostitis. This rarely demands any surgical treatment. It is a part of the inflammatory process, and subsides with the subsidence of the bone infection.

3. Bone destruction and suppuration are the important pathologic processes in chronic osteomyelitis—a necrosis that goes on, often over a period of years, to the production of sequestra of various sizes. This necrosis is associated with, and is the essential cause of, continued suppuration and, often, sinus formation. When these sequestra are extruded or removed, the sinuses usually close and the suppuration ceases completely, unless some undetached bone is still undergoing necrosis, or until the attenuated infection in the bone initiates a later cycle of necrosis and sequestrum formation.

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The relationship between bone necrosis and suppuration establishes two important principles in the surgical care:

The first of these is that one should wait until a sequestrum has actually formed before operating on the bone. One should provide, if necessary, adequate drainage through the soft parts; but if there is no actual sequestrum present, he should delay further procedure and check sequestra development by means of the X-ray. To chisel away more or less necrotic bone before there is a complete sequestration is not a good practice, though a common one.

The second principle is to content one's self, for the time being, at any rate, with the removal of the offending sequestrum or sequestra. This may be all that is necessary to effect not only cessation of suppuration but also definite healing.

We too often yield to the temptation to perform an extensive osteotomy in these cases of chronic osteomyelitis. One hopes by chiseling and scraping away to a solid column of so-called healthy bone to eradicate the disease process at once and to effect a prompt and permanent wound closure, but, instead, the trauma is inviting fresh sequestrum formation.

The importance of the shallow bone trough to afford an opportunity for contact with the overlying soft parts, is an accepted mechanical principle, which has, however, often made necessary the removal of extensive ledges of healthy bone in cases of chronic osteomyelitis, when a simple sequestrectomy might have served as a primary operation. I believe it is better to delay the plastic osteotomy until its necessity and its extent are more definitely determined, and until the field is more nearly aseptic. To effect cessation of suppuration, the removal of the dead bone is much more important than the removal of overlying healthy bone. In spite of preconceived notions, it is by no means necessary to remove bone over the length of a suppurative process, and probably all surgeons have sometimes seen bone cavities heal over after sequestrectomy, without removal of their sides, and have even occasionally observed the phenomenon of a large bone defect healing by granulations.

We are all familiar with the work done on bone infections by Dr. Jos. A. Blake, of New York, during the World War. Although I can not quote him verbatim, I am familiar with his teachings and practices on this subject, since I was fortunate to have thirty-four months' service under Dr. Blake in the French-American Orthopaedic Hospital in Paris. I feel, therefore, I should impress the necessity of conservatism in the operative treatment of osteomyelitis. I have seen a great many cases in which resection of the bones was done, and in the majority of them regeneration had not taken place. I have now a child who had a resection of the tibia, two and one-half years ago. At present he has two stalactites, whose points are at least an inch apart.

In the operative treatment of this condition, the pathology of the disease must be considered. First of all, there is the destructive period, when the infection is progressive. The destruction in this period is due to the toxin of the organism, and to the interference of circulation, this latter being due to thrombosis, the increased intramedullary pressure and to the stripping of the periosteum. The indications for treatment at this time are, first, to save life, and, secondly, to give a functional limb. To save life and to prevent the destruction of the bone, the pressure within the medullary cavity must be relieved, and this relief of pressure must be carried out with as little injury to the circulation as possible. I feel, therefore, that at this period an operation as simple as possible should be performed, and that is an incision in the soft parts with trephining of the bone to obtain free drainage. While the constructive period is progressing, it is at times necessary to drain either the soft parts or the bone to relieve abscesses that have formed. No attempt should be made to remove the sequestrum until it has fully formed, and then this should be done with as little injury to the soft parts (periosteum and bone) as possible. The best technic is usually to place the tourniquet on the limb, to cut down on one of the sinuses, to enlarge the opening of the cloaca and to tease out the fully formed sequestrum. When the sequestrum has been removed, the sinuses will usually heal rapidly. The difference between debridement of soft tissues and of bone is that the circulation of the soft tissue is in a direction of from within out, while the direction of the circulation to the bone is from without in; therefore, any radical operation on the cor-

tex of a bone is going to destroy large blood vessels rather than the terminal ones.

As an interne I was taught in acute osteomyelitis to chisel away the cortex and cancellus over the full extent of the medullary suppuration (often the entire length of the diaphysis) and then vigorously to scrape out the medullary cavity, thus taking away its surrounding cancellous bone. I am sure that the latter step, especially, is a very bad practice. The marrow pus can be adequately removed by far gentler means. The cancellus is important for bone regeneration and should be preserved as far as possible. As T. Wingate Todd, of Cleveland, has said, "Cancellous tissue must be conservatively dealt with and under no circumstances removed entirely. It is the bone abscesses which are 'thoroughly' curetted out so that only the compact shell remains, which results most disastrously from the point of view of healing. Especially is this the case in those instances in which pure carbolic swabbing is used to finish the destructive work of the curette."

I believe that one can accomplish his purpose equally by making drill holes of sufficient size and number, through which the medullaris can be drained. That intervening corticalis may necrose is not important; extensive necrosis may also occur after the free osteotomy. In a case of fulminating osteomyelitis of the humerus and staphylococcemia in a little girl, I made a drill hole at the upper and one at the lower end of the diaphysis, and removed the suppurating medulla by means of a strip of gauze passed on a probe from one opening to the other. The child made an excellent recovery. A sequestrum formed at each drill site, and when these were removed definite healing took place. As compared with osteotomy the full length of the humerus, this child was spared prolonged hospitalization, extensive scarring and, probably, deformity. I confess that, especially when the periosteum has been stripped up by pus, I sometimes yield to the temptation to remove as much of the presenting bone substance as is suppurating. I think, however, that this is not necessary if drainage is provided by multiple trephination; the bone that will not survive will exfoliate spontaneously.

While subperiosteal abscess is fairly common in acute osteomyelitis, a chronic subperiosteal abscess is only occasionally encountered. I have had during the past year a number of cases of chronic collections of pus within the bone, abscesses which have interested me greatly. The discrete abscess in the cancellous tissue has been long known as Brodie's abscess, and abscesses of the cancellous substance of the bone show clearly in the roentgenogram.

As contrasted with abscesses elsewhere in the bone, a chronic accumulation of pus in the medullary canal, like acute suppuration therein, often does not show as such in the roentgenogram. The appearance is then merely that of the associated osteoperiostitis. There is, however, this suggestion for a diagnosis in the film: there may be very little external thickening of the bone, and the osteitis spreads centripetally, encroaching on and sometimes, in one or more places, obliterating the medullary cavity. This internal thickening is by dense, dry bone, and such an osteitis or osteoperiostitis (when, by its appearance or otherwise, syphilis can be excluded, and when there is no evident necrosis or cortical abscess) indicates the possibility of a medullary abscess. If the medullary cavity is invaded by osseous growth in such a manner as to surround an "island" of pus, such a central abscess will appear in the film as a dark area, unless, indeed, the surrounding bone is so thick and so dense as to obscure the picture of the cavity within. The bone surrounding the abscess is usually of greatly increased density, but sometimes the cavity is in bone of normal or nearly normal density.

Chronic bone abscesses, central or cortical, are often, if not usually, residual from an osteomyelitis active even twenty or more years before the abscess makes its presence known. X-ray in a case which showed solitary, chronic, sterile, cortical abscess of the femur in a young woman whom I operated on within the past year, gave no evidence of any antecedent osteomyelitis or other discovered or remembered infection. In another case, the hip of a woman with the X-ray and clinical signs of a pea-sized bone abscess in the intertrochanteric region, of a month's duration, developing eighteen months after a trauma (fracture of the margin of the acetabulum), a small area of softened tissue was found, surrounded by dense bone, but there was no pus. Pathological report showed a circumscribed non-suppurative osteomyelitis.

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It is sometimes difficult to decide whether a small chronic abscess is cortical or subperiosteal in origin. Whether only a drop or two of pus is found in the cortex or several drams in the medullary canal, chronic bone abscesses have a uniform symptomatology,—persistent pain (often radiating and mistreated for "neuritis" and "rheumatism") and distinct localized bone tenderness. The condition is usually afebrile but sometimes febrile (100, even 101). Chronic bone abscesses tend to become sterile. that is to say, the organisms in the pus (usually staphylococci) are dead or much attenuated. The recognition of this phenomenon has led to treatment of these non-perforating abscesses, large or small, by simple evacuation through a small drill hole.

With the patient under an anesthetic, preferably nitrous oxid, an incision ordinarily about two inches in length is made through the skin and the underlying muscle is split, or retracted, to expose the periosteum. Through this and into the bone, at a point determined by X-ray or by the level of maximum tenderness, a drill from one-eighth inch to one-fourth inch in diameter is driven deeply enough to permit the escape of pus. If, perchance, the situation of a small abscess has not been estimated accurately enough for it to be thus tapped by the first opening, other drill holes can be made with little damage to the bone, or the surgeon may defer the completion of the operation to determine roentgenographically the relative levels of the abscess and his first drill hole. With the escape of pus, the drill is removed and nothing else is introduced into the bone, no probe, curet, or gauze packing. A culture is made from the pus, to determine what, if any, living organism it contains. A smear is also obtained and examined at once. (Often the smear shows a few staphylococci and the culture remains sterile). A small drain of folded rubber dam is laid in the soft parts down to, but not into, the opening in the bone, and the wound is otherwise closed by sutures. A simple gauze dressing completes the operation. The patient is immediately relieved of his pain. The drain is to provide for any further escape of pus from the bone, and to act as a safety valve in case of possible suppuration in the bone cavity or the soft parts, caused by dormant organisms awakened to activity. It is removed, usually without replacement, in three or four days, i. e., as soon as discharge has practically ceased. The small opening in the soft parts is then allowed to close and, ordinarily, healing of the entire wound is complete in ten days or less, few of which, usually, are spent in bed. Contrast this with the prolonged disability and invalidism, not to speak of the scarring and deformity, of wide-open osteotomy and slow "healing from the bottom," with its inherent risks of sequestrum and secondary operations.

Occasionally a small ring-like sequestrum forms at the drill site, and final healing is delayed until this escapes. The soft parts are healed before the opening into the bone; and, in turn, the drill hole fills with bone long before the abscess cavity does. Roentgenograms will often show this cavity in the bone persisting months and years, filled, probably, with granulation or fibrous tissue.

Walter Martin observed that cavities may fill with fibrous tissue and heal over while the bone defect is seen in roentgenograms to persist. Of Brodie's abscess, he said that if one of the walls of the cavity is cut away so that there is no over-hanging roof, the soft parts can be brought together and the skin sutured, as recommended by Watson Cheyne twenty-five years or more ago, for "the micro-organisms have not sufficient virulence to infect the blood clot." Martin believes that this is the most satisfactory method for small, chronic, localized abscesses surrounded by eburnated bone. It is, however, much more of an operation than the equally curative procedure of simply drilling into the abscess under nitrous oxide and it would be a rather mutilating operation if applied to unroofing an extensive collection of pus in the medulla. Bevan, of Chicago, and McWilliams, of New York, each also recorded the treatment of chronic bone abscesses by freely removing overlying bone, applying chemical antiseptics, and then closing the soft parts over, Bevan by primary, and McWilliams by delayed suture. The abscesses being sterile or nearly so, such osteotomies are unnecessary as the result of the simpler method described. The majority of the cases I have done thus far have proved entirely successful, including those in which the pus was not sterile, in two of which the overlying skin was somewhat red and the patient had had a slight daily rise in temperature. I believe, however, that healing may not

always promptly take place. It is conceivable that, as the the result of introducing a secondary infection or of the awakening into activity of dormant organisms, suppuration may continue and require further operation. Even accepting such a possibility, there is much to be gained and little to be lost by a trial of the simple minor operation of merely draining the chronic bone abscess through a small hole.

HEALTH IN RELATION TO NATIONAL DEFENSE.*

By W. ARMISTEAD GILLS, M. D., Richmond, Va.
U. S. Navy (Retired).

President Cleveland said that publicity was the people's greatest protection. If the sickness of our sailors and marines who occupy naval hospitals while suffering from preventable diseases were prevented, it would materially strengthen national defense and the United States Treasury. Would a private business enterprise make a partial survey of the operating machinery and limit repair to such incomplete examination, then expect efficiency from that portion which had not been surveyed and repaired? I doubt it, as few organizations have one hundred and fifteen million people to contribute to their support, who would be willing not to have an annual balance sheet discussed in the open, especially when it concerned the health of their loved ones, whom they had either loaned or contributed as well.

One of our admirals remarked a few years ago,—he'd rather go to sea with a physically fit crew and a poor ship, than a physically fit ship that was manned by physically unfit sailors. Times seemed to have changed. For well nigh two years, investigations and discussions have been limited to gun elevation, bombs, naval bases, Pacific manoeuvres, air planes, dirigibles, disarmament, Australian cruises, Arctic expedition, reconditioning ships, etc., and not the first person has "*elevated*" his voice *aloud* in behalf of the "man behind the gun."

Is this the result of tradition, custom, apprehension, or disinterest? One thing is certain: such silence is *not due to law*. Have we become callous to things human, or is it that the type of country lad, who protects the flag on the high seas, represents *uninfluential* homes? Until some *wizard invents automatic devices* to operate our defense machines, they must be operated by physically fit men, whose status at present is not commensurate, when compared with perfected ordnance. Great good would be derived from an annual human accountability, discussed by the people on "Navy Day." Total maintenance of the Navy within a decade cost $6,980,641,947, and, in my opinion, the people ought to know more about such expenditures, with the idea of tax reduction. Tuberculosis, for instance, is incompatible with a fighting machine representing the greatest nation on earth.

As soon as I determined that sickness, pensions, and deaths were taking place in our Navy in time of peace, for the most part preventable, being inimical to the nation's welfare, I commenced a survey, in keeping with my oath of office, which was February, 1919, completing the task January, 1924, when I was retired for physical disability. During this period, I traveled 40,000 miles by land and sea, writing my findings into two books, which I desire to get before Congress for necessary reform, in the interests of humanity, economy, and national defense.

The Medical Corps, United States Navy

With the removal of certain traditions, there can be no more attractive berth for a doctor of medicine, desirious or serving humanity and his own flag, rather than seek such a billet as a foreign medical missionary. While the salary is not so attractive, the many perquisites, in my opinion, outweigh the hardships of civil practice. Our present system appears not only necessary to advertise in order to obtain physicians, but they are untrained upon entrance, which, to my mind, is an injustice to the enlisted man. The Surgeon General recites in his annual report to the Honorable Secretary of the Navy, for 1923, page 2, that forty-three medical officers resigned their commissions, and that 12,000 letters were written to eligible physicians, endeavoring to recruit the corps, which I believe has been practically completed. Our guns are selected and our battleships are constructed by mature ordnance experts and naval constructors, respectively; besides, their physical welfare is discussed with the people.

The 1924 report, page 2, indicates thirty-one resignations, with sixty-seven commissions issued to recent graduates, who not only had no hospital training, but no practice in civil life

*Read before the Dinwiddie County (Va.) Medical Society.

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as well. These young physicians must be trained in naval hospitals at government expense, which includes assured incomes, no competition, free equipment, health statistics inadequately discussed publicly, with practically a voiceless clientele, promotion that is probably too much based on written examinations, insufficient contact with senior officers at the bedside—occupied with matters which could be cared for by business men—and, lastly, but not least, diagnoses resulting from superficial examinations, backed by military rank.

I can establish specifically, and at great length, that such a system, is harmful, and not conducive to the best interests of the public. In my opinion, its natural tendency is to destroy initiative, self-reliance and individual courage, the great qualities of American citizenship. It is wasteful, extravagant, and demoralizing. I sat on one general court martial three days to listen how a sailor made whiskey on a destroyer. Shouldering the rifle should be backed by a system calculated to elevate moral courage, as well as physical endurance. For the year 1925, 135 of our patients deserted. There is a reason why the sailor will run away, forfeit free medical attention, the pay roll, take the chance of losing his life incident to fatigue and exposure, to consult his home physician, and if apprehended or he returns otherwise, to face a court martial and be imprisoned.

The annual report for 1921, page 42, says, "There has been handled a number of imbeciles, several of quite a low grade of intelligence, and some morons, most of whom came to the attention of medical officers through the difficulties they got into either through their inability to perform their duties or through infractions of discipline which resulted in their becoming general court martial prisoners."

This is a mere sample of conditions which necessitate frequent change in personnel, and, if not removed, our sign boards along the road side will continue to concern the nation's welfare.

The following statistics, which results from our "System," speak for themselves: From 1920 to 1925, inclusive, 717,153 applied at recruiting stations; we selected 237,923, thus entering an opinion of mental, physical, and moral eligibility, with the assurance of elevating these qualifications. These, including reenlistments, constituted Our First Line of Defense during said period. Including repeaters, 617,852 patients were admitted to the sick list, remaining unfit for duty an aggregate of 12,604,220 days. If not guilty of misconduct, they earned pay. 33,150 were invalided back to civil life, with morbidity, mortality, and pensions unknown. 60,764 surgical operations have been performed. Cost of medical supplies, $6,627,119.14. Maintenance of naval hospitals, $18,649,792.04. Cost of sickness aboard ship and at naval stations, unknown. 4,839 died, either the result of disease or casualty.

The foregoing simply represent separations, account of illness, or disability. The number of separations due to courts martial, undesirables, misfits, desertions, under age, fraudulent enlistments, inaptitudes, etc., is unknown. *The loss of fourteen souls on the Shenandoah has stirred the nation, and yet these vital and financial statistics appear to give little concern, although they affect the nation's safety.*

At the annual physical examination of commissioned officers, numbering 8,922 for 1924, it was shown that 1,127 physical defects were in evidence, which was criticized by three of our able and interested officers as being of a perfunctory character, which remark seemed justified in the premises, as one year later, with the same officers, the 1925 physical examination recorded physical defects amounting to 7,295. The Surgeon General has designated 1,103 of these disabilities as "grave," and continues "the number of defects found and recorded at the 1925 examination was greatly in excess of the number found the year before. This was to be expected and is simply an indication of the greater thoroughness with which the examination was conducted under the new system adopted in 1925, rather than a sign that more defects existed in that year." In the 6th chapter of my first book, "The Price of A Sailor's Life?" written five years ago, I pointed at length that our examinations were not thorough, to say the least, but from the reactions which followed verbal criticism, I did not deem it expedient to submit my written survey. The disabilities existing in our commissioned officers is a very serious matter, and one which should be known to the people, in order that they may be given the most expert care. In 1925, we placed seventy-two officers on the retired list *not for age but for physical disability;* seventeen resulted from tuberculosis—they will draw pay for the rest of their

lives. This means that we must issue seventy-two more commissions. Diplomas issued at Annapolis have been estimated at $20,000 each. Make your own calculations. While it is true that some of the disabilities are not serious at this time, it requires excellent skill in such instances to prevent serious consequences, which is real preventive medicine.

Officers in charge of business institutions can adapt themselves, but a naval officer representing an integral part of a fighting machine must not only be physically fit for national emergency in the event of an engagement, but the direction of manoeuvres in peace time, preparatory to war, is also of moment. In the summer of 1921 I saw the first air plane which flew over the Island of Guam. Very soon thereafter, the officer who operated the plane had a fainting spell. A board consisting of three medical officers ascertained that heart trouble existed, and the patient was surveyed to the States. Thirty-seven officers on the active list have organic heart disease, while 717 are suffering with rapid action of the heart (tachycardia); the Surgeon General regards 247 as "grave." Under the excitement of battle in my opinion, this might figure in the *decision* as to victory, as much so as the velocity of the projectile. And *not* to disclose such things to the American people would be unjust, considering that the Liberty Motor, which throbs in the breast of the air plane, has been so completely exploited.

I came through the Panama Canal on the U. S. S. Argonne in September, 1922, with an admiral on the retired list. "I was paralyzed on my flagship," said he, "the medical board who examined me didn't take my blood pressure," he complained. Isn't it pertinent to inquire, what would have occurred had the admiral been in the midst of an engagement, directing his fleet? One of our captains on the active list, only fifty-two years old, died of high blood pressure December 5, 1925, in a civil hospital under the care of a civilian physician. He was actively engaged in submarine work up to two weeks before death, according to the Associated Press. 731 officers on the active list have either high, moderately high, or low blood pressure. The Surgeon General regards 226 as "grave." 133 officers have either albumin, casts, or sugar; the Surgeon General says that thirty-two are "grave." 1,640 are over-weight, 420 are reckoned as "grave." 731 have defective vision, 535 have defective hearing, 702 possess defective teeth, and yet this is an incomplete account of the 7,295 disabilities.

Adequate discussion of this very important situation would require a volume, if approached from necessary angles,—retirements, hospitalization, appropriate command. Example: all of us know what abscessed teeth lead to, and the wisdom of normal sight incident to target practice. For the entire personnel, within a half decade, resulting from *manifest conditions*, not due to an annual examination, there has been a total of 184,707 cases of gingivitis, abscessed teeth, pyorrhoea, diseased jaw bones, and diseased root canals. The necessity for dental hygiene in sleeping quarters aboard ship, from the viewpoint of dissemination, does not require comment. The Surgeon General recites in his annual report for 1924, "one of the urgent needs of the medical department is an increase in the personnel of the Dental Corps." With such revelations due to complete examination in our commissioned officers who only represent about one-eleventh of the entire personnel, what would happen if the enlisted man were overhauled and tabulated, which I feel is his due? The only way we will ever have a fighting machine, representative of the nation, is to determine disease or disability in its incipient stage, and return the subject to civil life, where he is adaptable. The duties of our machine are prescribed and exacting.

I was much interested, and astonished, to read the criticisms from the Australian Press in Sydney, July 26, 1925. The newspaper expressed surprise that "the Navy is composed of youngsters, instead of big, broad-shouldered, deep chested sailormen." It is not my purpose to make the impression that we have not capable, interested officers; *the trouble is that their criticisms are not brought to public attention.* Two instances will suffice. There is a bill before Congress for additions to naval hospitals, costing $600,000. The Fleet Surgeon, in his 1924 report, recites, at considerable length, unnecessary sickness, and how it can be remedied, setting forth that a private corporation would not be allowed such unhygienic conditions. If this comprehensive, able report had had one-fifth the publicity reference to the "prohibition" of illness, as has been indulged in as pertains the "prohibition" of rum, our defense

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would be materially strengthened, and perhaps the increase in hospitals would not be required.

Congressman Drewry and several other members of the naval affairs committee have been much interested in trying to obtain a hearing for me that health conditions might be threshed out in the open. Among other interested officers, I quote from the annual report for 1920, page 65, "the medical officer holds that more consideration might be given the personnel of the ship at the expense of technical requirements and military standards. Sailing dates and schedules could be made subsidiary to hygienic demands without detracting from the efficiency of the ship as a unit. It is true that a battleship is essentially a fighting organization, but it is also just as true that more harm can result in the immediate future from an over-crowded compartment, an incompleted ventilating job, a poor dish-washing machine system, than from the excessive consumption of fuel, barnacles on the ship's bottom, or the absence of the awe inspiring E on the turret or stack." The 1924 report, page 64 has this to say, "the U. S. S. Maryland, upon going South from New York to join the fleet, was made to carry approximately 1,000 men in addition to her complement. As a result, respiratory diseases spread rapidly. Over-taxation of bathing, berthing, feeding, laundry, and toilet facilities caused discomfort and unnecessary exposure to sickness." It is not difficult for me to understand why we have had 621,898 days on the sick list for tuberculosis within six years, which ought to cause concern. During the same period, 790 skulls have been chiseled open for mastoiditis.

Reckoning a selected personnel, present day preventive medicine, cost of maintenance, operating under military authority, and considering that the span of life has advanced ten years—our objective being the nation's safety,—civil health statistics are not only incomparable, but sickness to much extent should be well nigh nil. Desirous of avoiding prejudice, I have pointed principally to the official record, besides, criticisms to a very limited degree, considering the magnitude and importance of the subject under discussion, which cannot be adequately covered in such a brief.

A few recommendations as to the remedy:

I am of the opinion that sickness is sickness in any organization, and in the last analysis, we should hue to the line, and approach the most successful method employed in civil life, as far as is practicable.

Due to stress of war, the transportation and care of the sick cannot be normal, but this paper is not designed for what shall obtain in national emergency, but preparedness incident thereto. Among community interests, none is more important than public health, and among community liabilities none more serious than preventable sickness. Great Britain estimates that two billions of dollars are lost annually because of preventable illness, which has caused such concern that a crusade has been started, —account of Sir Arbuthnot Lane. The community welfare is definitely dependent on man's productivity, and this in turn is invariably influenced by the state of his health. If the community is to prosper, maintain high social, economic and intellectual standards, and otherwise meet its responsibilities, it must include among its major activities measures for the preservation of health and the prevention of disease. The principle has been accepted by the more progressive urban communities, and is rapidly gaining acceptance in rural communities.

Experience, moreover, is teaching the wisdom of employing competent professionally trained personnel, of paying reasonable compensation, and of making tenure secure when it is merited. It is teaching also that an adequate expenditure in this field, wisely administered, will yield large returns. The annual report for 1923 says "*making such recommendations as are regarded necessary concerning the prevention of disease, improvement of health, and increase of comfort and welfare of the personnel. In order to decrease desertion, the Navy must increase contentment. Contact with and the obtaining of germane information from the civilian medical profession.*"—Pages 94 and 97.

The Surgeon General recites in his 1925 report "it has become clear in recent years that the young physician, although he may be graduated from a class A school and an approved hospital, is by no means then equipped for service of the kind required of him in the Navy." Seventeen medical officers resigned in 1925. Military rank, in my judgment, belongs on the drill field, and in our hands should be limited to the enforcement of hygiene.

Rank is bound to carry with it a certain amount of tension and precision, which is psychologically out of kelter in the sick chamber, as the patient is not on a duty status, but is physically, and probably mentally, below normal. If 165,000 civilian doctors without military rank can command respect from their patients, *desertionless*, the experiment is worth a try-out with medical officers, who are non-combatants. The abuse of "rank" in the hands of certain medical officers, is dealt with at length, in my second book, "Three Years Under the Hammer." (25 chapters). If we had business men to care for business matters at naval hospitals, as is done in civil hospitals, the medical officer could devote his entire time to the sick. Admiral Sims writes me, "military medical corps, in the very nature of the circumstances, cannot ever be as efficient as experts in constant civil practice. But perhaps some scheme could be devised to give the military services the benefit of the skill of the latter in all cases where available."

In order to have a representative national defense, we must have American man power, which depends primarily upon selection and preventive medicine; secondly, skilful care of our defenders who incur unavoidable illness, and this is just as important as perfected ordnance. Disabled officers or sick sailors are not only unable to defend themselves, but the flag; besides, they cripple that part of our machine, relatively, which is fit to fight, and when separated, become a burden to civil life and the pension roll.

Does this matter concern Virginians? It should, for I estimate that at least 3,000 of our sailors and marines represent this commonwealth in Our First Line of Defense.

In conclusion, I am of the opinion that the Surgeon General's annual report should be adequately discussed before Congress, and liberally at civil medical societies, with the view of horse sense, American adjustments, in the interest of the American Navy, with special reference to "*contact with and the obtaining of germane information from the civilian medical profession.*"

3014 *West Grace Street.*

Following the reading of this paper, the Society passed the following resolution:

Resolved, That we, the members of the Dinwiddie County Medical Society, endorse the efforts expressed by Dr. W. A. Gills, in his paper, "Health in Relation to National Defense," as read by Dr. Gills before this Society.

Signed:

GEORGE S. FULTZ, *President.*
W. C. POWELL, *Secretary.*

Proceedings of Societies

The Southwestern Virginia Medical Society

Held its regular semi-annual meeting in Roanoke, March 30 and 31, the usual subscription banquet being held the first evening at the Patrick Henry Hotel. At the session which followed, papers were read by invited guests—Dr. Louis H. Clerf, of Philadelphia, and Dr. Joseph C. Bloodgood, of Baltimore. The following day, the sessions were held at the Elk's Club, the first paper presented being by Dr. O. H. Perry Pepper, invited guest, of Philadelphia. A number of interesting voluntary papers were read by members during the morning session. Between this and the afternon session, at which a symposium on "Appendicitis" was presented, the members and guests were entertained at luncheon by the Roanoke Academy of Medicine and an automobile ride to Mill Mountain.

This was pronounced one of the best attended and most interesting meetings in the history of the Society and a number of new members were received. It was voted that a new charter be secured from the State Society to include several additional counties and to hold the next meeting at Blacksburg in September.

Dr. J. M. Miller, Wytheville, is president, and Dr. E. G. Gill, Roanoke, secretary.

Princess Anne County Medical Society.

Several of the Princess Anne County doctors met at Virginia Beach, on April the 14th, and decided to reorganize their county society. This society received a charter from the Medical Society of Virginia in 1914, but, due to inactivity, the charter had been misplaced and a new charter from the State Society was requested. Meetings will be held on first Mondays monthly at Seaside Cottage Sanitarium at Virginia Beach. Dr. R. E. Whitehead, Norfolk, R. F. D. 5, was elected president, Dr. H. F. Dormire, Virginia Beach, vice-president, and Dr. Cora Z. Corpening, Virginia Beach, secretary-treasurer.

The Central District (Va.) Medical Society

Was organized at Farmville, Va., on April 16th, by about thirty doctors representing the

counties of Prince Edward, Amelia, Nottoway, Lunenburg, Charlotte, Appomattox, Buckingham, Cumberland, Powhatan, and Mecklenburg. This Society is primarily for the purpose of having good scientific programs and increasing interest in the community hospital shortly to be erected in Farmville to supply the needs of the people in the thirty-five mile radius surrounding Farmville. Not only will it not supplant the county societies as units of the State Society but it is believed that it should promote the activity of these units, as they may hold business meetings during the sessions of the district society.

Dr. P. A. Irving, Farmville, was elected president; Drs. Carter Weisiger, Cumberland, and W. R. Martin, Charlotte C. H., vice-presidents; and Dr. W. E. Smith, Farmville, secretary-treasurer. Meetings will be held bimonthly, in Farmville.

Charlotte County Medical Society.

Charlotte County doctors meeting in Farmville, Va., on April 16th, at the organization meeting of the Central District Medical Society, decided to reorganize their county society, which had become inactive, and applied for a charter from the State Society. Dr. C. W. Tucker, Drakes Branch, was elected president; Dr. R. A. Moore, Phenix, vice-president; and Dr. W. R. Martin, Charlotte C. H., secretary.

The Cumberland County Medical Society

Was organized by the doctors from that county when they attended the organization meeting of Central District Medical Society in Farmville, Va., April 16th. Dr. Carter Weisiger, Cumberland, was elected president, and Dr. Nash P. Snead, Cartersville, secretary-treasurer. This Society has asked for a charter from the Medical Society of Virginia.

The Warren-Rappahannock-Page County Medical Society

Held its regular meeting in Front Royal, Va., April 13th, Dr. L. F. Hansbrough, of that place presiding. Dr. Giles Cook, also of Front Royal, is secretary. Interesting papers were presented by Dr. E. C. Stuart, and Walter Cox, of Winchester, and Drs. W. J. Mallory and Virginius Dabney, of Washington, D. C.

Medical Woman's Club of Virginia.

The women physicians of Richmond who are members of the Medical Society of Virginia held a meeting at the Woman's Club on Friday, March 26th, to discuss the advisability of the formation of some sort of association among the women physicians who are located in the State.

Dr. Emily Runyon offered her home for the organization meeting and the invitation was extended to all the women on the roster of the Medical Society of Virginia for April 5th. Eight of the eighteen so listed attended, —and letters were received from several others endorsing the movement.

It was decided that membership should be limited to women physicians who were members in good standing in the State Society, that it should function socially and sociologically and in no way duplicate or interfere with participation in the programs of the Medical Society of Virginia, and that the officers should be a president and a secretary-treasurer, the latter to be, as far as possible, a resident of the city selected for the ensuing meeting of the State Medical Society. Sufficient dues to cover stationery and postage were imposed.

Dr. Mary B. Baughman, 6419 Three Chopt Road, Richmond, was elected president, and Dr. Cora Z. Corpening, Virginia Beach, secretary-treasurer.

Dr. Corpening, forthwith, extended an invitation to all members of the organization to be her house guests at the meeting of the Medical Society of Virginia in Norfolk October 12-15.

List of Women Physicians Members of Medical Society of Virginia

Dr. Mary B. Baughman, 6419 Three Chopt Road, Richmond.
Dr. Margaret Nolting, 409 E. Main St., Richmond.
Dr. Mary E. Brydon, State Office Bldg., Richmond.
Dr. Susan A. Price, Williamsburg.
Dr. Cora Z. Corpening, Virginia Beach.
Dr. Mary E. Roche, Medical Arts Bldg., Norfolk.
Dr. Susan W. Field, Farmville.
Dr. Emily Runyon, 3011 Brook Road, Richmond.
Dr. Emily Gardner, State Office Bldg., Richmond.
Dr. Gladys Smithwick, Roanoke Hospital, Roanoke.
Dr. Mary Harley, Sweet Briar.
Dr. Rachael Weems, State Teachers' College, Harrisonburg.
Dr. India Hunt, Mayo Clinic, Rochester, Minn.
Dr. Leta J. White, Bureau of Health, Richmond.
Dr. Elizabeth C. Whitehead, "Ingleside," Norfolk, R. F. D. 2.
Dr. Etta M. Hadley-Judd, 619 Church St., Lynchburg.
Dr. Margaret Kuyk, Bellevue Park, Richmond.
Dr. Pauline Williams, Medical College of Virginia, Richmond
Dr. Lula Garst, Catawba Sanatorium.

The South Piedmont Medical Society

Held its regular semi-annual meeting in Danville, Va., April 20, the president, Dr. J. D. Hagood, of Scottsburg, in the chair. There was an attendance of fifty doctors and an in-

teresting scientific program was presented. Between the afternoon and evening sessions, the visitors were guests of the Danville Academy of Medicine at a dinner served at the Country Club.

The next meeting is to be held in South Boston, November 16, and "Diseases of Childhood" has been selected as the subject for general discussion.

New officers elected at this meeting are: President, Dr. E. Howe Miller, Danville; vice-presidents, Drs. I. C. Harrison, Danville, C. D. Barksdale, Sutherlin, W. S. Ferguson, Lynchburg, and P. F. Tucker, Milton, N. C. Dr. George A. Stover, South Boston, was re-elected secretary-treasurer.

The County Society

For Better Acquaintance.

With a view to arousing greater interest in THE COUNTY SOCIETY, we hope every Virginia doctor will read this column.

Any inquiries should be addressed to the Medical Society of Virginia, 104½ West Grace Street, Richmond.

As far as possible, every county in the State should have a county medical society.

Any county containing as many as three eligible medical men may organize and apply for a charter from the State Society.

Only one component society shall be chartered in any county.

County societies which have become inactive should reorganize. Your Councilor, the President, or Secretary of the State Society, will attend your reorganization meeting, if requested to do so.

The following extract on COMPONENT COUNTY SOCIETIES, from the report of Dr. Olin West, secretary of the American Medical Association, at its Dallas meeting, is most timely:

"The county medical society is the fundamental unit in our scheme of organization. More than that, it is the essential factor in the record, whether of progress or otherwise, that may be made by medical organization as a whole. A constituent state association cannot permanently succeed, no matter how its own separate machinery may be developed, unless its component county societies are meeting their own responsibilities with reasonable efficiency. No more can the American Medical Association fully succeed unless its basic units are efficient. There are those things that must be done, and done well, by the county society for itself and for organized medicine as a whole. In building up the state association or the American Medical Association, great care should be taken to see to it that nothing is done to weaken the county society, whether by taking over the work it should do for itself or by any other method.

"As has been stated in reports heretofore submitted, there are, as is clearly shown by official reports from their own officers, too many county societies that are stagnant. In many instances persistent effort has been made to stimulate them into action without any measurable success. It might be worth while for the state associations to undertake a careful survey, each within its own jurisdiction, with a view to making a final effort toward bringing every chartered component unit as now constituted into useful activity, or, failing that, to effect organization anew by the combination of two or more counties into one society. This plan has already been tried to good advantage in some instances.

"Turning to a brighter side of the general picture, it is extremely gratifying to report that many county societies in all sections of the country are doing more and better work than ever before. Among these are some with relatively small membership. Their programs of work, scientific and otherwise, are prepared with care and carried out with inspiring enthusiasm. Such societies confer real benefits on their members and exert a most helpful influence in their own several communities. They are the strength of medical organization in the United States."

Womans Auxiliary

Medical Society of Virginia

At the request of the officers of the Auxiliary, this space has been set aside for communications from them regarding matters of interest both to the profession, and the women members of their families. All communications should be addressed to Mrs. E. F. Truitt, Secretary, Westover Avenue, Norfolk, Virginia.

Advantages of Organized Effort Among the Women.

The chief object of the National Auxiliary is to see to the organization of State Auxiliaries in each state of the union. This work is extending rapidly.

The State Auxiliary in turn is responsible for the formation of a local auxiliary in each community where a local Medical Society is

in existence; such local Auxiliary being formed with the consent of the local Medical Society, working under its guidance, and in full co-operation with its officers and committees.

If the doctors of Virginia did but realize what a tremendous aid the local auxiliaries would be to them, they would urge their wives, mothers, sisters and daughters to organize speedily.

How can they help the profession?

In creating and guiding public sentiment along the right lines in all matters pertaining to the physical welfare of the community and the individual.

In taking a positive stand in reference to uneducated irregulars, who so often through various methods get the backing of the ministers and organizations.

In taking the lead in various community health and uplift movements.

In extending the circulation of *Hygeia*, especially to schools, libraries and reading rooms.

In bringing the members of the profession closer together, creating a better feeling, and increasing the effectiveness of their organizations.

In providing entertainments at the various gatherings of doctors.

In these and in many other ways the women, by organizing, can be helpful to the profession and the public.

The State Auxiliary would urgently request individual doctors who read this statement to bring it at once to the attention of the women members of their families, and request them to take part in organizing local Auxiliaries throughout the State.

ALICE LEIGH
(MRS. SOUTHGATE LEIGH),
President, Woman's Auxiliary, M. S. V.

The Truth About Medicine

In addition to the articles enumerated in our letter of February 27, 1926, the following have been accepted:

Cutter Laboratories
Typhoid-Paratyphoid Prophylactic

Efficiency Products Co.
Hoffman's Non-Nutritive Nut Flour

Mead Johnson & Co.
Mead's Powdered Lactic Acid Milk (Cultured)
Mead's Powdered Lactic Acid Milk (Acidified With Lactic Acid U. S. P.)

H. K. Mulford Co.
Carbon Tetrachloride—Mulford
Capsules Carbon Tetrachloride—Mulford, 0.3 c.c.
Capsules Carbon Tetrachloride—Mulford, 1 c.c.
Capsules Carbon Tetrachloride—Mulford, 3 c.c.

Parke, Davis & Co.
Parke, Davis & Co.'s Standardized Cod Liver Oil

Squibb & Sons
Scarlet Fever Streptococcus Antitoxin—Squibb for the Blanching Test, 1 c.c. vials

Swan-Myers Co.
Concentrated Pollen Extracts—Swan-Myers, 2 c.c. vials; capillary tubes.

Change of Agency

Cryogenine, formerly distributed by A. Luniere Laboratories, is now distributed by the Gallia Laboratories, Inc. The Council has continued the acceptance of Cryogenine under the new distributor.

NEW AND NON-OFFICIAL REMEDIES

Hoffman's Non-Nutritive Nut Flour.—A preparation prepared from Tagua palm nuts, composed chiefly of unassimilable carbohydrates (mannans). This product is used as a means of filling out restricted diets. It is a non-nutritive food substance used to give bulk to foods thus serving to satisfy hunger without furnishing nourishment. Efficiency Products Co., Somerville, N. J. (Jour. A. M. A., March 20, 1926, p. 842.)

Carbon Tetrachloride—Mulford.—A brand of carbon tetrachloride—U. S. P. It is marketed in the form of capsules containing, respectively, 0.3 c.c., 1 c.c. and 3 c.c. H. K. Mulford, Co., Philadelphia. (Jour. A. M. A., March 20, 1926, p. 842.)

Ragweed Combined Pollen Antigen—Lederle.—For a description of the method of preparation and the form of marketing, see New and Non-Official Remedies, 1925, p. 287. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., March 20, 1926, p. 842.)

PROPAGANDA FOR REFORM

Kirkpatrick Pul-Bro-Tu.—This is a quack consumption cure exploited by one George Kirkpatrick, of Portland, Oregon. The nostrum was analyzed in the A. M. A. Chemical Laboratory and found to be for all practical purposes merely a weak solution of potassium iodide and solution of potassium arsenite (Fowler's solution). Pul-Bro-Tu has not the slightest value as a cure for tuberculosis: on the contrary the product itself may easily do harm while he who relies on it is virtually committing suicide. (Jour. A. M. A., March 6, 1926, p. 708.)

Report of the Council on Pharmacy and Chemistry.—During the past year, the Council has carried forward its work of informing the medical profession in regard to proprietary medicines which physicians are importuned to use. The work of this body of trained men who labor untiringly and without remuneration in the cause of rational and scientific medicine deserves wider recognition and acceptance. It will receive this when physicians recognize more generally the fact that those who compose the Council have the needed specialized training to enable them, better than the average physician, to form a correct estimate of the many new medicaments appearing each year. The Council publishes the annual New and Nonofficial Remedies which describes the medicinal preparations that are acceptable to the Council. Products not accepted are reported on in the annual reports of the Council and these reports are collected in the Propaganda for Reform in Proprietary Medicines. In addition the Council publishes the Epitome of the U. S. Pharmacopeia and National Formulary and the book Useful Drugs.

While the Council has brought about a revolution in the field of therapeutics, much remains to be done. The success of the further endeavors of the

Council will depend largely on the support which is given by the rank and file of the medical profession. Support can be most efficiently given by physicians and with full justice to themselves and their patients by confining their use of proprietary medicines to those which have been found acceptable for inclusion in New and Non-Official Remedies (Jour. A. M. A., March 20, 1926, p. 850).

Report of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry.—During the past year the Committee has concentrated its work on the support of investigations carried out in schools and laboratories of recognized standing by supporting investigations for which small grants were needed to purchase material and apparatus. Fourteen eligible problems of high quality were submitted.

The Committee appropriated two thousand three hundred and seventy-five dollars. Six papers were published during the year and a number are almost ready for publication. (Jour. A. M. A., March 20, 1926, p. 851.)

Report of the A. M. A. Chemical Laboratory.—During the year, the Laboratory has been engaged largely in evaluating synthetics and drug preparations for the Council on Pharmacy and Chemistry and in analyzing nostrums for the Bureau of Investigation. The work which the laboratory does for the Council on Pharmacy and Chemistry is becoming increasingly involved and difficult. Similarly the analysis of patent medicines for the Bureau of Investigation is more complicated than formerly. The Laboratory also carries out independent investigations: thus it has published a report on the quality of the market supply of cinchophen, a study of bismuth compounds and a study of liquid petrolatum-agar mixtures. The value of a chemical laboratory maintained by the American Medical Association is thoroughly demonstrated when comparisons are made between conditions existing in this and other countries. While abroad certain proprietaries are claimed to have this or that chemical structure, these claims are not made for them here when their composition has been shown to be otherwise. (Jour. A. M. A., March 20, 1926, p. 851.)

Radon (Radium Emanation).—It has been reported that the intravenous injection of long lived radioactive elements or the internal administration of radium, mesothorium or radiothorium is highly dangerous on account of the delayed harmful effects. This is due to the deposit of insoluble particles of these elements in the storage organs, namely, the bones, spleen and liver. These possible dangers apply to the administration of solutions of radium salts, but not to the ingestion of water charged with radium emanation (radon) since this is eliminated rapidly, the elimination being practically complete in the healthy individual in twenty minutes. (Jour. A. M. A., March 20, 1926, p. 893.)

The Defeat of the Streptococcus in Measles, Erysipelas and Puerperal Sepsis.—When the announcement was made that the Drs. Dick had shown that scarlet fever is a disease similar to diphtheria in that the streptococcus elaborates a toxin which is the causative agent, medical philosophers predicted that other investigators would soon reveal similar causative agents for related diseases. It appears likely that these predictions are to be realized within the current year. Now Ferry and Fisher report that they have elaborated a skin test for measles with toxin prepared from an organism found in the blood of patients suffering with this disease. Experiments are also being made with streptococci associated with erysipelas and puerperal sepsis and preliminary reports indicate the possibility of similar success.

Moreover other organisms than the streptococcus are being studied with relation to toxin production, notably the staphylococcus and more recently the tubercle bacillus. If these investigations are confirmed, it may well be that the present decade will pass into history as the one that saw the streptococcus defeated by medical science. (Jour. A. M. A., March 27, 1926, p. 955.)

Curay Light Applicators.—The source of light in a Curay lamp is an incandescent tungsten filament enclosed in a glass bulb. When used in the Curay apparatus, the lamp is operated on a higher current than its normal rating carries and therefore the life of the lamp is much reduced. The spectral energy distribution of the Curay lamp is mostly emitted in the form of heat and but a small fraction of the energy is emitted as ultraviolet rays. As compared with the quartz mercury arc lamp, the amount of ultraviolet rays emitted by the Curay lamp is insignificant.

The light of the Curay lamp is not comparable with sunlight for not only is the total amount less than that of sunlight, but a much smaller proportion of the energy is in the form of ultraviolet rays. Further the lamp has a glass bulb which strongly absorbs the ultraviolet rays given off by the filament. An exposure of the skin in actual contact with the quartz rod "applicator" supplied with the Curay lamp for one-half hour showed no ultraviolet erythema; an exposure of three and one-half minutes at a distance of one meter with a quartz mercury vapor lamp produced a marked erythema. The Curay Company supplies letters containing an account of supposed "cures" of colds and bacterial infections, but these concern uncontrolled experiments. (Jour. A. M. A., March 27, 1926, p. 971.)

The Kromayer Lamp.—According to experiments made by the manufacturer, Hanovia Manufacturing Co., the Kromayer lamp emits no radiation shorter than 2,000 angstrom units or longer than 14,000 angstrom units. Of the total radiation emitted, approximately 65 per cent falls in the ultraviolet field. The apparatus is dependable but no assertion can be made as to the properties of the rays. The company has collected the reports of results of investigations with the lamp, and supplies the references. (Jour. A. M. A., March 27, 1926, p. 972.)

Gonolin and Luesan.—These two products are manufactured by the Horovitz Biochemic Laboratories Company, New York. A. S. Horovitz, president of the Horovitz Biochemic Laboratories Company, has been referred to in connection with the asserted cancer cure "Autolysin." Later he appears to have been largely respsonsible for the "Proteogens" which the Council on Pharmacy and Chemistry declared inadmissible to New and Non-Official Remedies. Subsequently the company of which A. S. Horovitz is president, prepared a line of "Protein Substances" similar to the "Proteogens," each one being claimed to be more or less specific against a given disease or condition. The claims advanced for Gonolin and Luesan bear a striking similarity to those made for the discredited "Proteogens." (Jour. A. M. A., March 27, 1926, p. 972.)

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B. R. TUCKER, M. D., Richmond, Va.
P. W. HOWLE, M. D., Richmond, Va.
E. L. KENDIG, M. D. Victoria, Va.
A. L. GRAY, M. D., Richmond, Va.

ALEX. G. BROWN, Jr., M. D., Editor.

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Editorial

Blood and Lymph.*

General properties of the blood and its functions may well be considered by physicians. Blood passing through the vessels performs five general functions; (1) conveyer of foodstuffs to the tissues after the food has been properly prepared by digestion; (2) a means of transportation of oxygen from the lungs to the tissues of the body; (3) a fluid route for carrying off from the tissues various waste products formed in the metabolic processes of the body cells; (4) a medium for transmission of the secretions from the glands of internal secretion; (5) an equalizer of temperature and water content of the body.

Besides performing these general functions the blood possesses certain essential characteristics. The blood contains within its several elements gases, such as oxygen, carbon dioxide and nitrogen; proteins, as fibrinogen, paraglobulin, serum albumin; non-protein nitrogen bodies, as urea, uric acid, creatine, creatinine, ammonia salts, amino acids, phosphatids; non-nitrogeneous bodies, as fats, cholesterin, lactates; inorganic salts, as chlorides, carbonates, sulphates, phosphates of sodium, potassium, calcium, magnesium and iron; enzymes and special substances as lipase, glycase, epenephrin, prothrombin, antithrombin, immune bodies, complement and opsonins, etc.

Each 1,000 parts of blood contain 810.05 of water, 189.95 parts of solids, 133.4 parts of hemoglobin, 39.68 parts of protein, 1.09 parts of sugar, 1.298 parts of cholesterin, 2.052 parts of lecithin, 0.631 parts of fats, 0.759 of fatty acids, 0.054 of phosphoric acid, as nuclein. 3.675 of Na_20, 0.251 of K_20, 0.641 Fe_20_3, 0.062 of Ca0, 0.052 Mg0, 2.935 of C1, 0.809 of P_20_2, 0.576 of inorganic P_20_2.

A circulating fluid of such complexity possessing another essential characteristic for its proper function, coagulation and clotting, is at once a commanding problem in all diseases; a review of its influences in health and disease, however circumscribed, is important to the practitioner.

The total quantity of blood in the body in man is variously estimated; about seven per cent of the body weight is blood.

The red blood corpuscle engages in the most prominent function of carrying oxygen. Five million in each c.mm. of blood, it is a bi-concave disc having a diameter of about 7.7 u. They are constructed out of a lipoid substance, in the meshes of which hemoglobin is deposited. Hemoglobin is a simple globulin and a pigment hematin containing iron. When saturated, oxygen is present in hemoglobin in proportion of two atoms of oxygen to one atom of iron. The surface area of the corpuscles of the body has been estimated to be 3,200 square meters. Such a large surface area is available for oxygen absorptions as the red blood cells pass in single file through the capillaries of the lungs absorbing oxygen from the aveolar air. One may readily appreciate the extreme importance of hemoglobin in red cells, as these facts of physiology are considered.

The functions of the leucocytes are numerous. The ameboid movement of the cells gives the title of "wandering cells" as they migrate through the walls of capillaries into the surrounding tissue. While this is a normal process, under certain pathologic conditions this property is greatly increased. Leucocytes of the blood protect the body from pathologic bacteria by ingesting them which, according to Wright, depends upon the plasma of certain substances called opsonins. Leucocytes exert a part in the process of absorption and growth and in promoting regeneration and repair in the body. Leucocytes aid in the absorption from the intestines, they do a part in blood coagulation, they help in promoting a normal

*Reference, Howell and MacLeod (Physiology).

composition of the blood plasma in proteins.

Lymph is blood plasma. It is a plasma of the blood which has made its way through the thin walls of the capillaries; it bathes the tissue cells, bringing to these cells nourishment and removing from the cells the wastes of metabolism. Plasma of the blood is lymph in the making and it accumulates in the tissues under some pressure. It is removed, ladened with the waste materials, by the freely distributed lymphatic vessels. Lymph is tissue fluid; coming in it is filled with nutrition, going out it is filled with the wastes of cell life. The equation of fluids is maintained by chemical balances. By filtration, osmosis, and diffusion, there may be an interchange between blood plasma and tissue fluid, and between the tissue fluid and the fluid of the lymphatics. In this general way the fluid balances of the body blood and lymph courses of the body, and the great labyrinth of cell and intracellular spaces are carried on. On this depends life; on this depends cell life; on this depends detoxication of the body.

Physiologists have not yet reached a satisfactory explanation of these essential phenomena. One may, for the purpose of this comment, say that the filtration through the endothelial cells by osmosis and diffusion, the flow of the water from one place to another throughout the body is influenced by the difference of concentration of the dissolved substances contained therein. These forces control the amount and composition of the lymph.

Howell says, "it is evident that changes in the capillary pressure, however produced, may alter the flow of the lymph from the blood vessels to the tissues by increasing or decreasing the amount of filtration; changes in the composition of the blood, such as follow periods of digestion, will cause diffusion and osmotic streams tending to equalize the composition of the blood and lymph; and changes in the tissues themselves following upon physiological and pathological activity will also disturb the equilibrium of composition, and therefore, set up diffusion and osmotic currents."

"Blood Letting."

This is a therapeutic measure of ancient origin. Of beneficial effect in certain cases, the habit of indiscriminate use of it became widespread and a useful measure became a menace. No doubt, now, as formerly, venesection has its proper place in therapeutics. This measure today, with dramatic promptness, may bring striking relief in certain diseased states. With its power for good as well as its serious possibilities of harm, blood letting should be resorted to only when clearly useful. There are a number of factors to be considered when symptoms indicate a possible need for blood letting. The acuteness and intensity of the toxemia, the state of the heart and blood pressure, the quantity and nature of the blood itself, and the general status of the patient in weight and health, all, enter into the solution of the question whether or not venesection is indicated.

A. G. B., JR.

Transfusion.

Children seem always to be giving us questions to answer. In going into these questions it seems we follow their line of reasoning closely. For the questions which we are attempting to answer, whether we realize we have asked them or not, are: "What is it?" "How do you work it?" "What can you do with it?"

Regardless of how tiresome it may seem to repeat definitions, were it possible to carry at all times a clear, comprehensive, intelligent general definition of the subject we are discussing, working with or attempting to apply our discussions, work and applications would be much simpler, more direct and productive. For such definitions a system of mnemonics is often necessary and word analysis and derivation furnish the best. In the present case splitting our words gives us *trans* which is a Latin preposition meaning "across" and fusion which is from the Latin verb *fundere*, meaning "to pour." Then by blood transfusion we mean pouring across of blood from one individual to another, generally though not necessarily of the same species or kind. As to the second question "How do you work it?" The detail will be taken up separately and the methods gone over and into. Briefly and generally, transfusion consists of the vessel-to-vessel passage of blood, but we generally consider with this the indirect methods of conveying the blood, which are properly withdrawal and infusions, and all are considered under the general term *blood transfusion.*

The third question "What can you do with

it?" immediately begins to be answered in generalities when we ponder the definition. Blood is a liquid body tissue and under what conditions would it be poured across from one to another except when the patient manifests some blood abnormality and it has become necessary to overcome this abnormality, replacing the lacking tissue or modifying that present so as to bring it back to normalcy?

There are many contenders that blood transfusion, except to increase blood volume, has been a failure, but all seem agreed that for the replacing of hemorrhaged or leaked blood it is specific if used early before the tissues have had time to undergo degenerative changes between the blood's loss and the transfusion.

However, were this the only use, we might employ some more convenient fluid, such as saline or Ringer's solution or some of the gelatin preparations which might be "carried in stock." At times we find blood transfusion valuable in replacing almost any constituent of the blood except, perhaps, the leukocytes. And there are times when the stimulating effect of the new blood upon the bone marrow makes it worth while.

When it is used to restore all the elements, the actual volume of the blood and the hemoglobin and red cells are our main consideration. In these cases we know of no satisfactory substitute although volume in itself may be maintained at a fair level for several hours by introducing physiological salt solution which soon passes out of the body. The use of gelatin and gum acacia seems practically entirely abandoned for, while it has the advantage of maintaining blood volume for a longer period, there is grave danger of having tetanus bacilli present unless sterilized under pressure.

A consideration frequently coming up in these cases is the possibility of completely restoring the hemoglobin and red cells. The normal restoration of corpuscles seems a rather slow process and complete restoration passively seems to have a depressing effect on the blood forming organs and is not so desirable as a less massive dose.

Transfusion has a much wider field in secondary anemias, blood dyscrasias, pernicious anemias, cholemias, toxemia, sepsis, septicemia, hemophilia and purpura hemorrhagica.

In Acute Blood Loss transfusion is indicated where there is a known loss of 2,000 c.c. of blood or where there is a falling systolic pressure in the presence of hemorrhage or there is a fall to 90 mm. systolic pressure and the pressure remains there, in conjunction with the pulse rate and volume and the general appearance of the patient.

In Secondary Anemias the prime factor is to stop the blood loss and when this has been done restoration of the blood will follow gradually, but where this loss has extended over sometime transfusion exerts a stimulating effect on the hematopoietic viscera. But in case the hemoglobin has reached approximately 30 per cent, transfusion ceases to be optional and becomes a necessity.

In Pernicious Anemia transfusion is not curative and there is some doubt as to its producing change in the essential course of the disease but it undoubtedly much improves the general condition and, probably beside adding comfort, prolongs life. The early cases are benefited most and the continuance of the treatment depends upon the apparent benefit derived, for it seems after a time that repetition produces less to no beneficial effect. But it does appear that transfusion is the one therapeutic measure which produces most benefit. At opportune time one or two transfusions seem of benefit in each case of pernicious anemia.

In Cholemia transfusion exerts a valuable effect on the coagulation qualities in the blood and is a valuable preoperative treatment, lessening possibilities of hemorrhage.

In Toxemias, Sepsis and Septicemia where the individual is weakened and emaciated and where the resistance seems strong enough to balance against the invading powers of the attacking organism but not to overcome it, transfusion of new blood into the organism is often enough in favor of the patient to throw the balance toward the patient and prove a life saving procedure. This is especially true in cases of infected compound fractures and prolonged and extensive suppurative processes. In these cases and in cases of severe and persistent furunculosis, if time permits, the donor's resistance should be built up by a course of vaccines made from the offending organism.

In Hemophilia and Hemorrhagica Purpura there seems a deficiency in the blood platelets and we know of no way to supply these except by transfusion even though it

may, at times, be necessary to bleed the patient before giving the transfusion, in order not to increase the red cells and hemoglobin above the normal point.

The dose of blood to be given, except in pernicious anemia and for replacement of blood recently hemorrhaged, is a matter of discussion but in both pernicious anemia and massive hemorrhage the dose should be from 500 c.c. to 1,000 c.c. But in cases where there is need of stimulating effect, as in anemias, sepsis, toxemias, etc., a dose of from 250 c.c. to 400 c.c. seems to be a choice since there is definite stimulating effect to the blood building organs and there is no depression from an over dose of "passive" hemoglobin.

There must be considered, too, in these cases a certain element of danger to the recipient. These are principally introduction of air into the vessels, acute dilatation of the heart from too sudden introduction of the increased blood volume, transmission of infection and agglutination or hemolysis of the introduced corpuscles.

Should tingling pains over the body, a fullness in the head, oppression in the region of the precordium or excruciating lumbar pain develop in the recipient, it is imperative to discontinue the procedure.

Briefly then, we may conclude that in a branch of practice transfusions offer benefit to patients who suffer of recent and considerable hemorrhage, secondary anemias, blood dyscrasias, pernicious anemia, toxemias, cholemia, sepsis, septicemia, hemophilia and hemorrhagica purpura. J. O. F., JR.

News Notes

Norfolk Meeting, Medical Society of Virginia.

Norfolk doctors are already at work, preparing for a big meeting of the State Society, October 12-15. Dr. W. L. Harris, of that city, is president. Dr. R. Lloyd Williams has again had thrust upon him the chairmanship of the Local Committee on Arrangements, so every doctor who has attended Norfolk meetings when Dr. Williams was chairman, knows that a good time is in store.

The Program Committee has selected "The Liver" as the subject for general discussion and will have this discussed by Dr. F. C. Mann, invited guest, from the Mayo Clinic, Rochester, Minn., and Drs. W. B. Martin, Norfolk, Fred M. Hodges, Richmond, J. C. Flippin, University, and H. H. Trout, Roanoke.

Other good things will be in store for our members this year, so begin making your plans now to help make this one of the biggest and best meetings in the history of our organization.

American Medical Association.

The seventy-seventh annual meeting of the Association, held in Dallas, Texas, was the largest medical meeting ever held in the South. Dr. William D. Haggard, Nashville, Tenn., presided. The Medical Society of Virginia was represented in the House of Delegates by Drs. Southgate Leigh, Norfolk, and S. S. Gale, Roanoke.

Washington, D. C., was selected as the 1927 place of meeting and the following are officers for that meeting: President, Dr. Wendell C. Phillips, New York; president-elect, Dr. Jabez N. Jackson, of Kansas City, Mo.; vice-president-elect, Dr. John O. McReynolds, of Dallas, Texas. Dr. Olin West, Chicago, is secretary-manager.

The Virginia Society of Oto-Laryngology and Ophthalmology

Held its annual meeting in Petersburg, April 27th, Dr. H. S. Hedges, of Charlottesville, presiding, and Dr. E. U. Wallerstein, Richmond, at the secretary's desk. There was an attendance of sixty doctors from all sections of the State—the largest meeting in point of attendance of any yet held and twelve new members were received.

It was decided to hold the next meeting in Charlottesville. Dr. C. M. Miller, Richmond, was elected president; Dr. C. S. Dodd, Petersburg, vice-president; and Dr. Fletcher D. Woodward, Charlottesville, secretary-treasurer. Dr. H. S. Hedges, retiring president, automatically became a member of the council.

Whereabouts of Some Virginia Graduates.

The following Virginia doctors are now reported at Mayo Foundation, Rochester, Minn.: Drs. I. L. Harshbarger, M. P. Omohundro, H. H. Hurt, and C. B. Morton, as fellows in surgery, and Drs. L. M. Blackford, B. T. Horton and India Hunt in medicine. Dr. Horton has recently returned there after a sick leave, and Dr. Omohundro had to go home on ac-

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count of a Pott's fracture as the result of an accident.

Dr. John Staige Davis, Jr.. is at St. Lukes' Hospital, New York City.

Virginia graduates now at the Massachusetts General Hospital, Boston, are Drs. Robert B. Hiden, T. Duckett Jones, John S. Lawrence, Staige Davis Blackford, and John T. Bate.

Dr. A. S. Vaiden,

Of Monterey, Va., had a disagreeable experience recently, when he was attacked by a vicious dog when answering a call at the home of a patient. He was taken off his guard owing to the presence of the owner of the dog.

The Medical Society of the State of North Carolina

Will hold its annual meeting at Wrightsville Beach, June 15-17, inclusive. Dr. Wm. deB. MacNider, Chapel Hill, is president, and Dr. L. B. McBrayer, Southern Pines, secretary.

The Association of Surgeons of the Southern Railway System

Will have its annual meeting at the Willard Hotel, Washington, D. C., May 25, 26 and 27, under the presidency of Dr. N. H. Taylor, of New Market, Tenn.

Memorial to Dr. Virginius Harrison.

A monument to the memory of Dr. Virginius Harrison, Richmond, who died about a year ago, has just been erected at his grave in Hollywood Cemetery by his patients and friends and his plot has been put in perpetual care. The monument bears the following inscription:

"Virginius Harrison, M. D.,
Surgeon-General United Confederate Veterans.
Born March 21, 1865
Died June 6, 1925.
Beloved physician and Christian friend.
With a love that took no thought of self, he spent his life serving others, and thus fulfilled the law of Christ. His grateful patients and friends have erected this stone as a perpetual monument to his memory."

Faculty Promotions at U. Va.

The following promotions from instructor to assistant professor, in the faculty of the Medical School of the University of Virginia, have been announced to become effective next session: Dr. Vincent W. Archer, roentgenology; Dr. Henry B. Mulholland and Dr. James Edwin Wood, internal medicine.

Old Age Diseases Cause More Deaths in Virginia.

According to a report just issued by the State Board of Health, less than 30,000 Virginians died during 1925 and more than 10,000 of these were due to the four degenerative, or old age, diseases—cancer, heart diseases, apoplexy and Bright's disease. There was an increase in the number of deaths from cancer and apoplexy in 1925 over 1924, and a decrease in deaths from Bright's and heart disease.

The West Virginia State Medical Association

Holds its annual meeting at Morgantown, May 25, 26 and 27, under the presidency of Dr. J. R. Bloss, of Huntington. Mr. Sterrett O. Neale, Charleston, is executive secretary.

Dr. S. E. Oglesby,

Of the University of Pennsylvania Medical School, class of '21, has located in Lynchburg, Va., where he is associated with Dr. F. M. Perrow, in the practice of medicine and surgery. Dr. Oglesby is a B. A. of Washington and Lee University and, following his graduation in medicine, was for three years an interne at the University of Pennsylvania Hospital in Philadelphia. His last year there was spent as post-graduate chief house surgeon in the department of gynecology under Dr. John G. Clark.

Gifts to New York University Medical College.

Gifts totalling $29,000 have been made to the New York University and Bellevue Hospital Medical College during the current year. These gifts are in the form of $10,000 for expenses of the department of surgery; $5,000 for experimental work in ophthalmology; $10,000 for studies in prevention and cure of pneumonia; and $4,000 for the study of anaphylaxis.

The South Carolina Medical Association,

At its annual meeting in Sumter, last month, elected Dr. George H. Bunch, Columbia, president, and selected Anderson as its 1927 place of meeting. Vice-presidents are Drs. William C. Black, Greenville, Charles J. Lemmon, Sumter, and William L. Pressley, Abbeville. Dr. Edgar A. Hines, Seneca, was re-elected secretary-treasurer.

First Report From Virginia Xmas Seal Sale.

Reports from some of the counties have been slow in reaching the office of the Virginia Tuberculosis Association, but those to date show that $52,814.09 has been collected in Virginia from the sale of the Xmas seals, for 1925. It is thought that, with the additional amount to come from other localities, the total

will be slightly in excess of $55,000. There are places for every bit of it to be used.

Philadelphia Society Has New Home.

The Philadelphia County Medical Society dedicated its new home in that city, April 20 and 21, with appropriate ceremonies. On the second evening, there was a housewarming, with a musical program and dancing. The building is located at 21st and Spruce Streets.

Dr. R. A. Vonderlehr,

Formerly of Richmond, Va., but now an assistant surgeon in the U. S. Public Health Service, has been transferred from the Marine Hospital at Chelsea, Boston, Mass., to U. S. Marine Hospital No. 43, Ellis Island, New York, effective May the 15th.

Porto Rico Mothers Win Recognition.

Mothers get official recognition in Porto Rico, at least in the newly created Child Welfare Board of the Island. There are five members of this board, all appointed by the Governor with the advice and consent of the Senate, and two of these must be "mothers of families." The board is to study problems affecting children, suggest changes in child welfare laws and inspect children's institutions.

Child Laborers in German Fields.

Poverty, labor shortage, higher wage demands by adults, and the large influx of school graduates into industry are blamed for the increased number of children found to be working on German farms by the National German Society for the Protection of Children. The average age at which these children began to work was ten years, but some began work at the age of four or five. The hours of work varied from two to five in winter and from two to twelve the rest of the year. In many cases working conditions were bad and the work unsuited to the strength of children.

Dr. Charles M. Caravati

Recently delivered an address on "Certain Interesting Phenomena of Self" before the Catholic Woman's Club, of Richmond.

Dr. A. R. Gray,

Recently of Bentonville, Va., is now located at Nokesville, Va.

Major Allen J. Black,

Of the Medical Corps, of the U. S. Army, has been transferred from Ft. Andrews, Mass., to Camp Devens, Mass. Major Black is a much interested member of the Medical Society of Virginia—his native State—despite the fact that his duties take him far from base.

Dr. L. C. Cox,

Recently resident physician at Stonega Hospital, Stonega, Va., is now city health officer of Kingsport, Tenn.

Dr. A. J. Crowell Honored.

Davidson College has conferred the degree of D. Sc. upon Dr. A. J. Crowell, Charlotte, N. C., prominent North Carolinian and at this time president of the Tri-State Medical Association of the Carolinas and Virginia.

Dr. Hunter Williams,

For sometime located at Red Hill, Va., advises of change of his address to North Garden, Va.

Dr. and Mrs. Charles E. Bowles,

Of Pulaski, Va., visited friends and relatives at Amherst, Va., last month.

Syracuse Druggists Abandon Sale of Specific Remedies.

The *Bulletin of the New York State Department of Health* states that a representative of the State Department of Health, working in co-operation with the Syracuse Health Demonstration under the Milbank Fund, recently visited seventy-eight druggists in Syracuse and called their attention to the harm done by dispensing so-called specific remedies for gonorrhea and syphilis. Eighty per cent of those carrying these so-called remedies agreed to abandon the sale of such drugs.

The object of this campaign is to discourage self-treatment of these diseases which so often results in harm to the patient and a sense of false security which will lead to complications of the disease and a further spread of the infection.

Dr. J. B. Catlett

Returned to his home in Staunton, Va., the latter part of April, after attending clinics in Richmond for a time.

Dr. Walter C. Klotz,

Formerly connected with Blue Ridge Sanatorium, this State, but for the past several years medical director of the National Home for Disabled Volunteer Soldiers, Johnson City, Tenn., has resigned to accept a position on the faculty of Cornell University Medical School of New York.

Hospital Devoted to Dental Surgery.

Many dentists gathered in Norfolk, on the 4th of this month, for the formal opening of

the world's first hospital devoted to dental surgery and its allied subjects. The hospital has been built in the Norfolk Navy Yard as a detached unit of the Naval General Hospital and has really been in operation for almost two years. Public announcement of the establishment of the institution has been withheld, however, over the experimental stages until it was demonstrated that the movement had met with success. Commander Paul White, U. S. N., Dental Corps, is the commanding officer.

Dr. R. H. Woolling

Has returned to Pulaski, Va., after spending sometime in New York taking a special course in X-ray work. He has been placed in charge of the X-ray work in the new hospital which was opened in Pulaski about the first of this month.

Surgeon General of the Army Re-Appointed.

Major General Merritte W. Ireland has been re-appointed by the President as surgeon general of the U. S. Army, and the appointment was confirmed by the Senate early in April.

Malaria Mosquitoes Controlled by Airplane Dusting.

Considerable success has attended the experiments of the U. S. Department of Agriculture in the use of the airplane as a means of distributing poison dust over both treeless and wooded swampy areas for the control of malaria mosquitoes. In the final tests, more than 90 per cent of the larvae in the area treated were destroyed with one application. Paris green was the larvicide used in all the experiments. Even in heavily wooded areas where the water was protected by dense overhead foliage and where the planes had to be flown high enough to clear the tallest trees, the dust was found to have penetrated the thick growth and to have reached the water in sufficient quantities to destroy the larvae. Because of the small amount of Paris green (one-twentieth of a pound to several pounds per acre) required to kill the larvae, it was mixed with an inert dust, finely ground silica earth being the carrier used in most cases.

In each test a series of pans containing known numbers of larvae were distributed over the area to be dusted. Counting the living larvae after dusting furnished a check on the effectiveness of the application.

Dr. Nelson Mercer,

Who recently returned to private practice in Richmond, was on April 24th promoted to the rank of lieutenant colonel in the Medical Reserve Corps of the U. S. Army.

Dr. Oscar B. Hunter,

Washington, D. C., assistant dean and professor of bacteriology and pathology, George Washington University Medical School, recently delivered the Kober Foundation lecture at Georgetown University.

Dr. Beverley R. Tucker,

Richmond, was the guest of honor at the annual dinner of the Pittsburgh College of Physicians, last month, and delivered the Bedford Lecture on "The Physicians' Contribution to Literature."

Use of Toxin-Antitoxin Urged.

Last year there were reported 226 deaths from diphtheria in Virginia. Four counties, representing about one twenty-fourth of the State's population, in which toxin-antitoxin campaigns had been conducted, reported only four deaths.

As it takes about five months for toxin-antitoxin to bestow complete immunity, Dr. E. G. Williams, State Health Commissioner, urges health authorities and family physicians to see that children are immunized now, as six months from now is the usual season for diphtheria to reach its height in cases and deaths. The child vaccinated now need not fear diphtheria five or six months from now.

Dr. A. D. Ownbey,

Formerly of Newport News, Va., located in Miami, Fla., the latter part of January, with offices at 1237 S. W. Eighth Street. During his second month there, he received an appointment on the surgical staff of the city hospital in Miami.

Among Chairman for American Forestry Week.

Dr. H. S. Hedges, Charlottesville, and Dr. R. D. Tucker, Powhatan, were among the local chairman named to interest Virginians in forest conservation during American Forestry Week, this Spring.

Dr. M. H. Watson

Returned to his home in Chatham, Va., the latter part of April, after a short stay at University, Va., having gone there to accompany his wife and infant son home from the University Hospital.

Automobiles Menace Child Life.

"The automobile is as great a menace to child

life today as scarlet fever and whooping cough combined," according to statistics compiled by the Metropolitan Life Insurance Company. Deaths from automobile accidents, according to the company's figures, have increased 50 per cent since 1920, two-fifths of the deaths being among children under fifteen. In other respects 1925 is pronounced a banner year among the Metropolitan's industrial policy-holders, who constitute one-seventh of the total and one-fourth of the rural population of the United States and Canada. Big gains were made in reducing death rates from measles, scarlet fever, diphtheria and whooping cough —the four chief children's diseases. A low record was also established for diseases associated with maternity.

Civil Service Examination.

Receipt of applications for assistant statistician (public health) will close June 8. The examination is to fill vacancies in the U. S. Public Health Service in Washington, D. C., and in the field. Full information and application blanks may be obtained from the U. S. Civil Service Commission, Washington, D. C., or the secretary of the Board of U. S. Civil Service Examiners at the post-office or custom house in any city.

Every Baby a Full-Time Job.

The care of one baby is a full-time job for its mother for five hours and forty-one minutes every day, and a part-time job the rest of the twenty-four hours, according to an estimate based on the reports of a group of seventeen young mothers, collected and tabulated by the U. S. Bureau of Home Economics. The babies were under one year of age.

The Leslie Dana Medal,

For the most outstanding achievement in the prevention of blindness and the saving of sight, will be awarded this year to Miss Louisa Lee Schuyler, of New York City. This is given for her work in launching the movement for the prevention of blindness in 1908 and for her consistent active interest in this movement from its inception until she became confined to her home on account of illness several years ago. Though eighty-eight years of age and ill, Miss Schuyler still keeps in close touch with the activities of this work.

Dr. J. M. Holloway

Was elected president of the Fredericksburg (Va.) Gun Club, at its organization meeting, recently.

Dr. and Mrs. G. G. Howery,

Christiansburg, Va., were recent visitors in Wytheville, Va.

Dr. J. M. Bishop,

Of the class of '24, Medical College of Virginia, who has been company physician with the Virginia Iron, Coal and Coke Company, at Inman, Va., has moved to Appalachia, Va., and entered general practice.

Dentists Hold Joint Meeting.

The Virginia State Dental Association and the North Carolina Dental Society held a joint meeting in Richmond, the middle of April, which was well attended. At this meeting, Dr. W. M. Hodgkin, Warrenton, became president, of the Virginia Association, Dr. W. G. Delp, of Rural Retreat, was elected vice-president, and Dr. A. M. Wash, Richmond, secretary and treasurer. Virginia Beach was selected for the 1927 meeting place of the Virginia Association while the North Carolina Association decided to hold its next meeting in Greensboro.

Dr. J. B. Stone,

Richmond, had the misfortune last month to lose his automobile by fire which was caused by an explosion of gasoline in another car in a double garage.

Hospital Service in the United States.

The *Journal of the American Medical Association* for April 3rd has published an interesting report on "Hospital Service in the United States." This shows that the United States has at present a total of 6,896 hospitals of all types and kinds, with 802,065 beds, constantly caring for an average of 629,362 patients.

Figures for Virginia show that ye have 106 hospitals, there being 1 bed for every 661 population. Sixty counties in the State are without hospitals for community use.

Lakeview Hospital,

Suffolk, Va., announces that Dr. W. T. Gay, junior member of its surgical staff, will take care of general surgery during the absence of Dr. J. E. Rawls, who sailed on April 27th, with the Interstate Post-Graduate Assemblies of North American Physicians, to attend clinics abroad. He will return in July.

The American Psychiatric Association

Is to hold its annual meeting in New York City, June 8 to 11 inclusive, headquarters being at the Waldorf-Astoria. The meeting promises

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to be exceedingly interesting. Dr. C. Floyd Haviland, of Albany, will preside. Dr. Earl D. Bond, Philadelphia, is secretary.

The Medical Association of the Valley of Virginia

Has prepared an interesting program for its next meeting in Harrisonburg, May the 27th, under the presidency of Dr. P. W. Boyd, of Winchester. In addition to papers by the members, there will be one by Dr. Hugh H. Young, invited guest, of Baltimore. Information about the meeting may be obtained from Dr. Alex. F. Robertson, Jr., acting secretary, Staunton, Va.

School Attendance of Country Children Delaware.

Average attendance in the rural schools of Delaware has increased from 86 days per pupil to 133 days in the last six years, according to a study recently completed under the auspices of the State Bureau of Education. The investigators believe that the increase is due to the establishment of a State school system with authority centered in the board of education to supervise attendance, to special efforts of teachers, and to the general movement throughout the State for better schools. Weather, illness, parental indifference, and agricultural and other forms of work were found to be the chief causes of absence.

How to Insure a Happy Adoption.

Adoption, like marriage, should not be lightly entered upon. In "Psychoclinical Guidance in Child Adoption," just published by the Children's Bureau, Dr. Arnold Gesell, of Yale, urges all child-caring agencies, both public and private, to give every child under consideration for adoption complete mental and physical examinations, to determine so far as possible his mental and physical capacities, and to see to it that he lives with his foster parents for a probationary period before the final adoption papers are signed. Dr. Arnold Gesell's article contains the history of several typical cases brought to the Yale Psychoclinic. These illustrate the need of precautionary measures to safeguard the interests of foster parent and child alike.

Dr. Whitfield Hurt by Auto.

Dr. James M. Whitefield, city coroner of Richmond, was painfully cut about the head, and his sister who was with him narrowly escaped injury when his automobile was struck by another machine, the latter part of April.

The Gill Memorial Eye, Ear and Throat Hospital,

The private hospital of Dr. E. G. Gill, will be opened in Roanoke, Va., about the first of July. It has been especially designed and equipped for the treatment of diseases of the eye, ear, nose and throat. It has four stories, is absolutely fireproof and contains twenty rooms. Only graduate nurses will be employed. The hospital will have departments for ophthalmology, oto-laryngology, bronchoscopy and esophagoscopy, and facio-maxillary surgery. Dr. Gill will have Dr. Charles A. Young, of Roanoke, associated with him.

Dr. Allen H. Moore,

Formerly of New Market, Va., but now of Doylestown, Pa., has recently received an appointment as first assistant to Dr. I. M. Boykin, chief obstetrician at the Abington Memorial Hospital, Abington, Pa., one of the larger Philadelphia suburban hospitals. This appointment places Dr. Moore in charge of the Pre-Natal Clinic.

Million Dollar Drive on for Medical College of Virginia.

As we go to press, a drive is on to raise $1,000,000 for additional buildings and increased activities at the Medical College of Virginia. The plan is to raise $500,000 in the city of Richmond and $500,000 from the rest of the State. It is of interest to note that this college has given to Virginia more than two-fifths of its physicians, one-half of its dentists, nine-tenths of its graduate pharmacists, and a large number of nurses. Richmond alone has 249 physicians, 88 nurses, 106 pharmacists, and 85 dentists who are alumni of the Medical College of Virginia.

Dr. H. H. Ware,

Of the class of '24, Medical College of Virginia, after a time at the New York Nursery and Child's Hospital, has received an appointment as house surgeon at the New York Lying-In Hospital and entered upon his service there the first of this month.

Dr. and Mrs. Clyde F. Ridge,

Thurmond, W. Va., visited Mrs. Ridge's parents in Richmond, in April. Dr. Ridge is

a member of the class of '22, Medical College of Virginia.

Dr. George W. Schenck,

Norfolk, Va., has accepted the captaincy of Ambulance Company No. 110, succeeding Captain Albert V. Crosby, resigned.

Married.

Dr. George W. Parson, of Raven, Va., and Miss Beatrice Elizabeth Smither, of Richmond, April 24th.

The National Tuberculosis Association

Will hold its annual meeting in Washington, D. C., October 4-7, immediately following the meeting of the International Union Against Tuberculosis, which meets in the same city, September 30-October 2. Already many prominent men and women have promised to attend and address these meetings. Special arrangements will be made for interpreting foreign language papers. The sessions of the National Tuberculosis Association are open to all persons interested; those of the International Union Against Tuberculosis are open only to members.

Further information about either of these meetings may be obtained from the National Tuberculosis Association, 370 Seventh Avenue, New York City.

Dr. W. R. Cushing

Was elected chairman of the board of directors of the Bank of Dublin, Va., at a meeting of the stockholders held last month.

The American Health Congress,

In which sixteen national organizations are participating, is meeting in Atlantic City, May 17-22, under the auspices of the National Health Council. Headquarters are at the Steel Pier. There will be something to interest everybody, ample hotel accommodations, and reduced railroad rates. For other information, write at once to the National Health Council, 370 Seventh Avenue, New York City.

Dr. M. E. Hundley,

Martinsville, Va., has closed the Lucy Lester Hospital, at that place, while he is abroad attending clinics.

Dr. and Mrs. H. T. Hopewell,

Of Strasburg, Va., have returned home after a visit to Lexington, Va., where they went to visit their son, Tilden, who is at Virginia Military Institute.

Dr. C. Mason Smith

Was recently elected one of the directors of the Fredericksburg, Va., Rotary Club, for the ensuing year.

The American Board of Otolaryngology,

In addition to the examination held at Dallas on April 19th and at San Francisco on April 27th, will hold another examination at the Otolaryngological Clinic, Royal Victoria Hospital, Montreal, on Tuesday, June 1st.

Information may be secured from the secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Virginia Specialists Attend Dinner.

At the recent annual dinner of the Society of Ex-House Surgeons of the Manhattan Eye, Ear and Throat Hospital, held at the Canadian club, Belmont Hotel, New York City, the following specialists of this section were in attendance:

Dr. Warren White, Norfolk, Va.
Dr. Meade Edmunds, Petersburg, Va.
Dr. Fletcher D. Woodward, Charlottesville, Va.
Dr. Wm. Robt. Weisiger, Richmond, Va.
Dr. John McGuire, Bluefield, W. Va.

Garvan to Finance Fight on Common Cold.

A research to discover the cause and cure for the common cold was undertaken by the American Drug Manufacturers' Association, at its convention in New York City recently, when an offer to finance such a research was made by Francis P. Garvan, president of the Chemical Foundation. Mr. Garvan stated that it is estimated that on account of the common cold, ten days of every man, woman and child's activity a year, on the average, is lost throughout this county, and this, coupled with the fact that so many ills to which flesh is heir develop from the common cold, makes it one of the greatest scourges of humanity.

Stomatalogic Number.

The July issue of *Medical Life* will be a Stomatology Number, devoted entirely to the "History of Stomatology" by Dr. A. J. Asgis, of New York. The issue will be profusely illustrated. There will also be a chapter by E. B. Hardisty on "Stomatologic Education in the United States in 1926."

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Minnesota Fights Diphtheria.

Diphtheria, the child's worst enemy, is being vigorously attacked in Minnesota. State health authorities propose to stamp out the disease by distributing toxin-antitoxin free in any amount needed to local health officers, physicians, and school boards throughout the State.

Loans for Babies, France.

French mothers can borrow or rent for new babies cradles, clothes, baby chairs, perambulators, scales, and milk sterilizers through a Cradle Society just formed by the Besancon committee of the Red Cross. Two hundred and ninety new babies have been supplied already, no charge being made in two-thirds of the cases.

Movies a Holiday Treat for Children in Bolivia.

Bolivian children of 12 years of age and under in Bolivia can go to the movies only on holidays and then just to see pictures authorized by the police, according to a decree recently issued by the President of Bolivia, the purpose of which is to safeguard the morals and welfare of the children.

Dr. G. Colbert Tyler,

Recently of Heathsville, Va., has moved to Newport News, Va., and is located at 2505 Chestnut Avenue.

Doctor Wanted.

For Smith's Island, Maryland. For further particulars, write Nick Evans, Ewell, Maryland. (Adv.)

Wanted—

By Junior Medical Student, work for summer months. Experience in didactic, religious, and laboratory work. Good technician. Year of dispensary service. B. A. graduate. Consistent worker. References. Have passed Junior Board. Write W. C. Henderson, Medical College of Virginia, Richmond. (Adv.)

Obituary

Dr. Harry Gilmore Carter,

Medical Director and Superintendent of Piedmont Sanatorium, died suddenly at that institution on the night of April 10. In the death of Dr. Carter the State has lost an able, conscientious, useful, patriotic, public servant and the medical profession a member whose scientific work contributed to its usefulness and whose whole life was in accord with its highest traditions.

He was born in Northumberland County, Virginia, November 8, 1886, and was educated in the private school of Rev. Claybrook at Kilmarnock. He graduated from William and Mary College with A. B. degree in 1908, and was principal of the High School at Heathsville for two years after which he began the study of medicine at the Medical College of Virginia. While studying medicine he taught at the Richmond Academy and also at the Richmond public night schools, by which means he worked his way through the medical school from which he graduated in 1914. He was intern at the George Ben Johnston Memorial Hospital at Abingdon for one year then began private practice in Emporia, Virginia.

Eighteen months later he broke down with tuberculosis and went to Mt. Regis Sanatorium, to Catawba Sanatorium and to Gaylord Farm Sanatorium in Connecticut.

On April 1, 1918, he assumed charge of organizing and operating Piedmont Sanatorium. The establishment of this institution had been authorized by the Legislature for the treatment of the colored tuberculous of the State. The success that has attended its operation is chiefly due to Dr. Carter's ability and skill. The Sanatorium now has a capacity of 140 and is kept filled and usually with a waiting list. The contentment and cheerful attitude of the patients and their satisfactory progress attests the splendid administration of the institution and the fine spirit of kindliness and professional skill of the Director.

Although for many months the Doctor's health was frail and delicate and he had to limit his physical exertion, his mind was always active and alert and he kept a close watch over the affairs of the Sanatorium and the welfare of the patients. His reports of the Sanatorium and the papers he wrote on the various phases of tuberculosis among the colored attracted nation-wide attention. His observations were keen and the analysis of figures accurate. His papers were scientific

and were valuable contributions to medical knowledge.

Recently he was invited by the Knickerbocker Medical Society of Cleveland, Ohio, to read a paper on tuberculosis in the Negro race. He had been working rather intensely on the paper and Saturday night announced to his wife that he had finished the paper. Soon afterwards he had a severe hemorrhage and died almost instantly.

The love and esteem in which he and his wife were held was evidenced by the large numbers that came from far and near to his home the next day; white and colored, rich and poor, and all creeds and denominations came to pay their respect and express their sorrow. The Piedmont choir sang their Spirituals at the funeral and the quartet of their own accord followed the remains to Baltimore and sang again at the interment.

Dr. Carter in 1916 married Miss Mabel Holland, of Baltimore, who survives him.. He also leaves two children—Margaret and Harry Gilmore, Jr. E. G. W.

Dr. Lemuel Cornich Shepherd,

Norfolk, Va., died at his home in that place, April 4th, at the age of sixty-two years. He was born in Petersburg, Va., but moved to Princess Anne County when he was quite young and spent his early life in that county. He studied medicine in New York City, graduating from Bellevue Hospital Medical College in 1886, after which he returned to Virginia and joined the Medical Society of Virginia that year. For the past thirty-seven years he had been a practicing physician in Norfolk and for many years he served as health commissioner and bacteriologist for that city. He was a Mason and a prominent churchman. His wife, two daughters and a son survive him.

Resolutions on Death of Dr. L. C. Shepherd

At the regular meeting of the Norfolk County Medical Society, held April 5, 1926, the following resolutions were passed:

That in the death of our beloved confrere, Dr. Lemuel Cornick Shepherd, which occurred April 4, 1926, we have lost from our midst a wise, painstaking, conservative councilor; a gentle, considerate and sympathetic friend; a pure and active Christian gentleman. For years Health Officer of the City of Norfolk, and later City Bacteriologist, and Ex-President of the Norfolk County Medical Society.

Resolved, That the Norfolk County Medical Society express its deep sorrow at the death of our late beloved associate, Dr. Shepherd.

Resolved, further, That this memorial be spread on the minutes of the Society, published in the daily papers, and a copy be sent to his family.

P. St. L. Moncure,
R. S. Kight,
W. E. Driver,
Committee.

Resolutions on Death of Dr. George Ross.

The following was adopted by the Richmond Academy of Medicine at a meeting held on April 13, 1926:

George Ross,

Born in Culpeper County, Virginia, October 22, 1838; graduate of the Virginia Military Institute, 1859; graduated with the degree of Doctor of Medicine from the University of Virginia, 1861; elected to membership in the Medical Society of Virginia in 1872, and to honorary membership in 1906; member of the Richmond Academy of Medicine, its president for a term, and honorary fellow until his death; surgeon of the cadets of the Virginia Military Institute at the battle of New Market; honored by high office in various organizations of Confederate Veterans; president of several railroad surgeons' associations; a founder of and professor in, the University College of Medicine in Richmond; a practitioner of medicine in Richmond, with success and distinction for sixty years; died in Richmond, March 31, 1926, in the eighty-eighth year of his age.

If it be meet to praise here one whose life typified the flower of our race; if it be proper to utter here words of admiration for one whose career personified the finest traits of our profession; if it be permissible, in these times, to set down in measured phrases, words of respect, veneration and love for one whose life as a physician reflected the virtues of a Virginia gentlemen influenced and graced by the teaching of religion, surely the occasion is at hand to present an expression of our feelings upon the life and the death of our lamented member, Doctor George Ross.

The items in the prefatory biographic sketch of Dr. Ross's career serve to summarize bare events, but this is not enough. A life like his is rich in values of heart and spirit gravened on a background of the scientific and professional. As a young physician, he came to Richmond under the ban of poverty cruelly inflicted by the inexorable exigencies of civil war, and here he pursued for more than sixty years the duties of his profession. During this period, he early rose to front rank. His practice was large, his professional services being sought by a clientele ranging from the foremost citizens to the most obscure. He was ever ready and willing to serve this big practice which came to him through long years. In the several fields of general medicine of his time, he performed an excellent standard of work. In family practice he was noted for the high quality of his service; and in the lying-in room his skill was particularly demonstrated, his services being sought also by his fellow-practitioners in their obstetrical perplexities and difficulties. As a surgeon, he was not without distinction; in "railroad surgery" dealing with traumatisms incident to railroad accidents among employees and passengers, more common then than now, his skill was especially shown. In these cases, his industry, his indefatigable efforts, his strict personal care, brought many a mangled limb back to good function. For years he was the local surgeon to the Chesapeake and Ohio Railway, and

for many years he was the chief surgeon of the Southern Railway system.

Dr. Ross was connected with medical education in Richmond as a member of the faculty of the Medical College of Virginia, and, later, as a founder and professor in the University College of Medicine. In the latter he was professor of obstetrics and emeritus professor of obstetrics. His discussions will be remembered by those who had the opportunity to be under his tutelage, as being characterized by a charm and erudition rarely found in the medical lecture-room, as well as rich in scientific and practical values. Few could give finer diction to medical discussions than Dr. Ross. His lecture on the "Female Pelvis" was notable in that day; and each year when he gave this lecture, his lecture-room was crowded with students eager to hear it.

Dr. Ross was a distinguished veteran of the Confederate army. He served as surgeon to the cadets of the Virginia Military Institute at the battle of New Market; he was chief surgeon of A. P. Hill's Third Army Corps, Army of Northern Virginia. He was soldier and surgeon throughout the war, having left the University of Virginia at the beginning of hostilities at the head of the student body to join the army in Virginia. In later life, he was chief surgeon to veterans of the Southern Confederacy.

But in thus inadequately cataloguing his medical achievements, one can give only a glimpse of the man, for besides his skill in medicine, his life stands adorned with a peculiar spirituelle, a fineness, a charm, rare among men. His devotion to duty; his exquisite sense of honor; his indefatigable effort to serve; his unfailing loyalty to trust; his readiness to give of himself—these are a few specifications in the spiritual make-up of his rare personality. To these may we not add his charm of presence, his conviviality, his geniality, his winning grace of manner?

These were lesser but beautiful qualities of his fine soul. From these he gave much of optimism, of good cheer, of confidence in the sick room, in the home of sorrow and in the hearts of those who looked to him for succor and cure. Surely, these qualities of aesthetic service in the physician which assuage the anguish of fear, of grief, of pain, whether real or imaginary, by a magic optimism, must claim from us a modicum of praise and set for us a pattern for emulation in these times.

In any evaluation of one's life work, Dr. George Ross may well be placed among the foremost. He stands well abreast of that strong and virile group of medical men who came to Richmond after the civil war and served this city for years with honor to themselves and to their profession. They were strong men—strong of heart and strong of mind—of whom we, walking now in the light of their setting glory, may well be proud. In this group, the life of Dr. Ross is not diminished, but stands forth in bold relief—distinctive and clear—among his noble confreres.

In green old age, his life gently and majestically came to a beautiful physiologic end. He spent the last decade of his life retired from active work, musing upon the beauties of a higher life, shedding blessings upon those who touched the hem of his gracious spirit, giving to the home of his last days a fragrance and a beneficence that those who were fortunate enough to come within its influence, will not forget. Such a spirit as resided in this man may, like Browning, at the end, have sung:

"I was ever a fighter, so—one fight more,
The best and the last!
I would hate that death bandaged my eyes and forebore,
And bade me creep past.
No! Let me taste the whole of it, fare like my peers,
The heroes of old,
Bear the brunt, in a minute pay glad life's arrears
Of pain, darkness and cold.
For sudden the worst turns the best to the brave,
The black minute's at end.
And the elements' rage, the fiend-voices that rave,
Shall dwindle, shall blend,
Shall change, shall become first a peace out of pain,
Then a light, then thy breast,
O thou soul of my soul! I shall clasp thee again,
And with God be the rest!"

Whereas, Death has taken our venerated member Dr. George Ross, after a life of achievement and service; be it,

Resolved, That the Richmond Academy of Medicine records its high esteem and respect for Dr. Ross as a man and as a physician.

That a page be set aside in the minute book of the organization which shall be dedicated to his memory, setting forth these resolutions as well as the chief events of his splendid career.

That an expression of sympathy be tendered Dr. Ross's family, and

That these resolutions be published in the *Virginia Medical Monthly*.

MARK W. PEYSER,
Secretary-Treasurer.

Dr. George Burley Martin,

Formerly of Richmond, Va., where he was associated with the late Dr. Lewis C. Bosher, died at the U. S. Hospital at Oteen, N. C., April 11th, aged forty-three years. He was a native of Nelson County, Va., and studied medicine at the Medical College of Virginia, from which he graduated in 1910. He had been a member of the Medical Society of Virginia since that year. He served in the army during the World War and, just about the time he was to be discharged in 1919, he was taken down with tuberculosis and was sent to the Government hospital where he remained until his death. His wife survives him.

Dr. William G. Painter,

A well known and prominent physician of Big Stone Gap, Virginia, died in the George Ben Johnston Memorial Hospital, Abingdon, April 22nd, after an illness of several weeks. He was apparently in good health until February 1st, when he developed heart trouble which was the cause of his death. Dr. Painter was fifty years of age. He graduated at the Medical College of Virginia, in the class of 1901. He is survived by a wife and six children.